

100 GREAT EVENTS  
THAT CHANGED THE WORLD

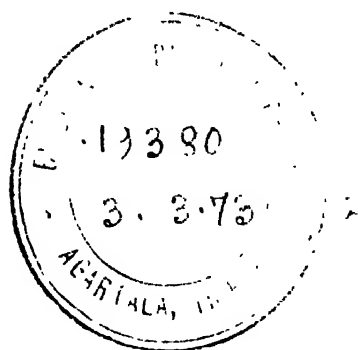




# 100 Great Events That Changed The World

FROM BABYLONIA TO THE SPACE AGE

EDITED BY  
JOHN CANNING



901.9  
C225

ASIA PUBLISHING HOUSE  
BOMBAY CALCUTTA NEW DELHI MADRAS

MADE AND PRINTED IN GREAT BRITAIN BY  
MORRISON AND GIBB LIMITED, LONDON AND EDINBURGH  
T.267.R2.N.

# Contents

	<i>Page</i>
Editor's Note	15
WHAT WAS HAPPENING BEFORE HISTORY BEGAN	<i>E. Royston Pike</i> 17
Great Discoverers Whose Names We Shall Never Know	
THE CODE OF HAMMURABI	<i>E. Royston Pike</i> 25
Ancestor of Modern Law	
THE BELIEF OF AKHNATON	<i>E. Royston Pike</i> 31
The Introduction of a New Note into the Religious Thought of the World	
THE FOUNDING OF ROME	<i>Ronald Seth</i> 38
The Foundation also of Modern European Civilization	
THE DAWN OF THE SCIENTIFIC METHOD	<i>Douglas Collier</i> 44
Thales and Democritus Change the Basis of Man's Thinking	
THE TEACHINGS OF BUDDHA	<i>Roger Kent</i> 49
The First Great Popular Religion	
LAO-TZE FOUNDS TAOISM	<i>Roger Kent</i> 56
A Major Spiritual Influence in Asia	
THE BATTLES OF SALAMIS AND PLATAEA	<i>Ian Fellowes-Gordon</i> 63
The Greeks Defeat the Persian Empire and Determine the Course of European Civilization	
THE HIPPOCRATIC METHOD	<i>Douglas Collier</i> 69
A Greek Physician Proves, Centuries Before his Time, that it is the Patient who should be Treated, not the Disease	
THE THOUGHT OF PLATO AND ARISTOTLE	<i>Roger Kent</i> 74
Two Greek Philosophers between them Lay the Foundations of Moral Philosophy and the Science of Reasoning	
THE CONSCIENCE OF KING ASOKA	<i>E. Royston Pike</i> 81
A New Standard in Rulership	

# CONTENTS

Page

THE BATTLE OF ZAMA	<i>Roger Kent</i>	87
The Defeat of Carthage by Rome Puts an End to Possible Carthaginian Influence in Europe		
JULIUS CAESAR GAINS POWER IN ROME	<i>Roger Kent</i>	94
The Emergence of Rome as an Imperial Power Becomes Inevitable		
ACTIUM	<i>Ian Fellowes-Gordon</i>	102
The Battle that Determined the Cultural Axis of Europe		
THE TEACHING OF JESUS	<i>Roger Kent</i>	108
Christianity is Born in the Middle East		
THE VISION OF ST PAUL	<i>Roger Kent</i>	114
The Foundation of Christianity as a World Religion		
CONSTANTINE ADOPTS CHRISTIANITY	<i>Roger Kent</i>	121
And Makes It the Dominant Religion in Europe		
THE DESTRUCTION OF THE ROMAN EMPIRE	<i>Dominic Kennedy</i>	127
Teutonic Tribes Spread Out Through Europe		
THE FOUNDING OF ISLAM	<i>Roger Kent</i>	134
A Dominant Factor in the Development of the Middle and Near East		
THE CORONATION OF CHARLEMAGNE THE GREAT	<i>Dominic Kennedy</i>	141
The Inauguration of Modern European Civilization		
OTTO THE GREAT REFOUNDS THE HOLY ROMAN EMPIRE	<i>Dominic Kennedy</i>	147
Europe Unified at a Crucial Stage of Her History		
THE BATTLE OF HASTINGS	<i>Edward Ashcroft</i>	153
The English Spirit is Born Out of Conquest		
THE COUNCIL OF CLERMONT	<i>Roger Kent</i>	159
Paradoxically the Crusades Enlarge the Life and Culture of Western Europe		
THE INTRODUCTION OF THE JURY SYSTEM	<i>Dominic Kennedy</i>	167
Henry II Bestows on Englishmen the Boon of Impartial Justice		

# CONTENTS

	<i>Page</i>
MAGNA CARTA The Basis of Democratic Liberty	<i>Dominic Kennedy</i> 173
THE MODEL PARLIAMENT The Beginnings of Parliamentary Democracy	<i>Dominic Kennedy</i> 180
THE INVENTION OF GUNPOWDER A Revolution in Man's Ability to Kill	<i>Douglas Collier</i> 187
THE BLACK DEATH A Calamity that Altered the Economy of Europe	<i>Ian Fellowes-Gordon</i> 193
JOAN OF ARC'S VICTORIES AND MARTYRDOM The Creation of French Nationalism	<i>Edward Ashcroft</i> 199
JOHANNES GUTENBERG'S MOVABLE TYPE Learning, Previously the Prerogative of the Few, Sweeps the World	<i>Ian Fellowes-Gordon</i> 206
THE SACKING OF CONSTANTINOPLE A Direct Cause of the Rebirth of Learning in Europe	<i>Dominic Kennedy</i> 211
COLUMBUS DISCOVERS THE NEW WORLD Europeans Enter Another Hemisphere	<i>Dominic Kennedy</i> 218
THE SEA-ROUTE TO INDIA Vasco da Gama Transforms the Commerce of the World	<i>Dominic Kennedy</i> 224
CORTES CONQUERS MEXICO The Wealth of the New World Enriches the Old	<i>Dominic Kennedy</i> 230
COPERNICUS'S THEORY The Earth no Longer the Centre of the Universe	<i>Ian Fellowes-Gordon</i> 237
MARTIN LUTHER INAUGURATES THE REFORMATION The Split of Western Christendom	<i>Roger Kent</i> 242
THE FOUNDING OF THE EAST INDIA COMPANY The Beginning of British Rule in India	<i>Ronald Seth</i> 249
THE VOYAGE OF THE PILGRIM FATHERS The Founding of the Modern American Nation	<i>Ronald Seth</i> 258

# CONTENTS

Page

DISCOVERY OF THE BLOOD'S CIRCULATION	<i>Ian Fellowes-Gordon</i>	265
William Harvey Lays the Basis of Modern Medicine		

THE SCIENCE OF NEWTON	<i>Ian Fellowes-Gordon</i>	271
The Calculus, the Theory of Gravitation, and the Spectrum of Light		

THE PEACE OF WESTPHALIA	<i>Roger Kent</i>	276
Firmly Plants Protestantism in Europe		

THE EXECUTION OF CHARLES I	<i>Edward Ashcroft</i>	282
The Catalyst that Finally Gave Britain a Constitutional Monarchy		

LOUIS XIV RULES AS ABSOLUTE MONARCH	<i>Edward Ashcroft</i>	289
The Greatest Age in French History		

THE HABEAS CORPUS ACT	<i>Ronald Seth</i>	296
Guarantee of Personal Liberty		

WILLIAM III BECOMES KING	<i>Ronald Seth</i>	302
Constitutional Monarchy Established		

THE BATTLE OF BLENHEIM	<i>Ronald Seth</i>	309
An End to the Threat of French Hegemony in Europe		

GEORGE I—THE KING WHO SPOKE NO ENGLISH	<i>Ronald Seth</i>	315
The Beginnings of Cabinet Government		

JETHRO TULL'S "HORSE-HOEING HUSBANDRY"	<i>Frank Usher</i>	321
Lifting the Ancient Curse from the Land		

THE FALL OF QUEBEC	<i>Ronald Seth</i>	327
James Wolfe Lays the Foundations of the Future Dominion of Canada		

SPINNING JENNY	<i>Ian Fellowes-Gordon</i>	334
The Beginning of the Machine Age		

CAPTAIN COOK REDISCOVERS AUSTRALIA AND NEW ZEALAND	<i>Ronald Seth</i>	340
The Way Paved for the Founding of Two New Nations		

# CONTENTS

		Page
JAMES WATT'S STEAM ENGINE Power for the Industrial Revolution	<i>Ian Fellowes-Gordon</i>	346
✓ "THE WEALTH OF NATIONS" Adam Smith and the Science of Economics	<i>E. Royston Pike</i>	352
✓ THE WAR OF INDEPENDENCE Birth of the American Nation	<i>Ronald Seth</i>	359
✓ THE MANIFESTO OF MISS WOLLSTONECRAFT An English Governess Starts the Movement for Women's Rights	<i>E. Royston Pike</i>	365
✕ THE FRENCH REVOLUTION The Roots of European Liberalism and Nationalism	<i>Edward Ashcroft</i>	371
✓ AUSTERLITZ Napoleon Dominates Europe	<i>Edward Ashcroft</i>	380
✓ WATERLOO The Beginning of British Nineteenth-century Predominance	<i>Edward Ashcroft</i>	387
THE VISION OF ROBERT OWEN Towards the Welfare State	<i>E. Royston Pike</i>	395
THE STOCKTON AND DARLINGTON RAILWAY First of a Network that Shrank Continents	<i>Ian Fellowes-Gordon</i>	402
FARADAY DISCOVERS ELECTRICITY The Transformation of Everyday Life	<i>Ian Fellowes-Gordon</i>	408
✓ THE REFORM BILL OF 1832 The First Step Towards a Universal Franchise	<i>Ronald Seth</i>	413
REFRIGERATION Food from the Farthest Corners of the Earth	<i>Ian Fellowes-Gordon</i>	419
✓ THE DURHAM REPORT The Principles that Saved the British Commonwealth	<i>E. Royston Pike</i>	424
INVENTION OF THE CAMERA The Birth of Photographs, Moving Pictures and Television	<i>Douglas Collier</i>	431
DISCOVERY OF ANAESTHESIA Suffering is Relieved, and Surgery as we Know it Begins	<i>Douglas Collier</i>	436

# CONTENTS

	<i>Page</i>
✓ THE TEN-HOURS' DAY A Break-through in Factory Legislation	<i>E. Royston Pike</i> 442
✓ THE YEAR OF THE REVOLUTIONS Europe Moves Towards Popular Freedom	<i>Ronald Seth</i> 449
✓ COMMODORE PERRY OPENS UP JAPAN The Beginning of Japan's Rush from Backward Nation to World Power	<i>Ronald Seth</i> 456
THE BESSEMER CONVERTER Steel for All	<i>Ian Fellowes-Gordon</i> 463
CHARLES DARWIN'S BOMBSHELL The Book that Revealed Evolution as the Master-key to Nature's Secrets	<i>E. Royston Pike</i> 468
"DAS KAPITAL" Karl Marx Paves the Way for Communism	<i>Ronald Seth</i> 475
THE UNIFICATION OF GERMANY Portent of World Strife	<i>Ronald Seth</i> 481
THE VOICE IN THE WIRE Bell Invents the Telephone	<i>Ian Fellowes-Gordon</i> 487
THE INVENTION OF THE INTERNAL COMBUSTION ENGINE The Beginnings of Mechanical Transport for the Millions	<i>Ian Fellowes-Gordon</i> 492
✓ THE MATCH GIRLS' STRIKE "A New Leaf in Trade-union Annals"	<i>Tony Parker</i> 498
THE DISCOVERY OF X-RAYS Man Sees Through Solids	<i>Ian Fellowes-Gordon</i> 504
MARCONI SENDS THE FIRST WIRELESS MESSAGE A Revolution in Man's Ability to Communicate	<i>Ian Fellowes-Gordon</i> 509
THE DISCOVERY OF RADIUM A New Weapon Against Pain and Suffering	<i>Ian Fellowes-Gordon</i> 515
FREUD AND THE UNCONSCIOUS MIND A Revolution in Our Knowledge of the Human Personality	<i>Lawrence Wilson</i> 521



# CONTENTS

Page

MAN'S FIRST POWERED FLIGHTS	<i>Ian Fellowes-Gordon</i>	528
A First Step in the Conquest of the Air		
JAPAN DEFEATS RUSSIA	<i>Ronald Seth</i>	533
The First Asiatic Nation to Become a World Power		
THE ASSASSINATION OF THE ARCHDUKE FRANZ FERDINAND	<i>Edward Ashcroft</i>	538
The Immediate Cause of the First World War		
THE BATTLE OF THE MARNE	<i>Edward Ashcroft</i>	546
Germany Loses Her Chance of Victory Never to Regain It		
THE OCTOBER REVOLUTION	<i>Edward Ashcroft</i>	553
Russia Becomes the World's First Communist Country		
THE TREATY OF VERSAILLES	<i>Edward Ashcroft</i>	560
The Seed is Sown of the Second World War		
EINSTEIN'S THEORY OF RELATIVITY	<i>Ian Fellowes-Gordon</i>	568
A Revolution in Physics		
BAIRD TRANSMITS A PICTURE OF AN OFFICE-BOY'S FACE	<i>Douglas Collier</i>	573
The Arrival of Television		
RUTHERFORD'S DISCOVERY	<i>Ian Fellowes-Gordon</i>	579
The Fantastic Power in the Atom		
PENICILLIN	<i>Ian Fellowes-Gordon</i>	585
A Victory over Death		
THE STATUTE OF WESTMINSTER	<i>Ronald Seth</i>	591
Commonwealth Emerges from Empire		
THE NEW DEAL	<i>Frank Usher</i>	598
A New Era in Capitalism		
HITLER ENTERS THE RHINELAND	<i>Edward Ashcroft</i>	604
A Great Stride Towards the Second World War		
THE BATTLE OF BRITAIN	<i>Edward Ashcroft</i>	612
Hitler Never Again the Master of Events		
THE ATTACK ON PEARL HARBOUR	<i>Edward Ashcroft</i>	618
The United States Enters the Second World War, and Victory Becomes Inevitable		

## CONTENTS

	<i>Page</i>
✓ THE BATTLE OF STALINGRAD <span style="float: right;"><i>Edward Ashcroft</i></span>	625
The Tide of the Second World War Turns Decisively in Favour of the Allies	
HIROSHIMA <span style="float: right;"><i>Ian Fellowes-Gordon</i></span>	632
The Day War Became Unthinkable	
THE EMERGENCE OF CHINESE COMMUNISM <span style="float: right;"><i>Ronald Seth</i></span>	637
China Becomes a Modern World Power	
THE FIRST FLIGHTS INTO SPACE <span style="float: right;"><i>Ian Fellowes-Gordon</i></span>	642
Man Ceases to be Earthbound	
THE NEW AGRARIAN REVOLUTION <span style="float: right;"><i>Frank Usher</i></span>	647
The Dilemma Posed by the Use of Toxic Chemicals on the Land	
✓ DE GAULLE RETURNS TO POWER <span style="float: right;"><i>Edward Ashcroft</i></span>	654
European and World Politics Take on a New Pattern	
INDEX	663

# Illustrations

	<i>Facing Page</i>		<i>Facing Page</i>
Akhnaton	32	Napoleon and his Old Guard	321
The Laws of Hammurabi	32	Commemorative Plate of	
Romulus and Remus	33	Waterloo	321
Buddha	33	Robert Owen	416
Lao-Tze	33	Capital and Labour	416
Salamis	64	Year of Revolutions	417
An Athenian Academy	64	"Man's Cousin"	417
Stone Pillar at Sarnath	65	Pierre and Marie Curie	448
The Conversion of St Paul	65	Franz Ferdinand at Sarajevo	449
Constantine and Pope Syl-		The Arrest of Princip	449
vester	160	The October Revolution	544
Charlemagne	160	The "Big Four" at Versailles	545
The Battle of Hastings	161	A Nuremberg Rally	545
The Black Death	192	German Troops Enter the	
Columbus	193	Rhineland	576
Cortes and Montezuma	193	Some of "The Few"	577
Luther	288	A Formation of Spitfires	577
Huss	288	Goering and Air Staff	
The Execution of Charles I	289	Officers	577
Louis XIV	289	Pearl Harbour	608
The "Day of Poniards"	320	The Battle of Stalingrad	609
"La Marseillaise"	320	Hiroshima	640
The Execution of Louis XVI	320	Astronaut Walking in Space	641



## Editor's Note

THE HISTORY of the human race on earth is rather like the history of individual human beings: important events do not occur in an orderly progression at regularly spaced-out intervals of time, but in irregular pulses. In the life of an individual there are long periods when nothing very exciting appears to be happening, and others of swift change and progress. In the life of nations the same phases can be observed: on the one hand there is the period following the break-up of the Roman Empire of the West, when the human spirit seems becalmed in a long night; on the other the comparatively short period which sees the powerful ferment of ideas that undermined the *ancien régime*, and the frenzied eruption of activity we know as the French Revolution.

It has been my objective to choose from the period of recorded history one hundred events which have marked a quickening of the human spirit or have been turning-points in the paths that men have taken. As history in its broadest sense is the story of man the task, though fascinating, was a formidable one: for everything is relevant, is grist to the mill, whether it be the foundation of a great religion or philosophic system, a water-shed battle, a seminal political event, an epoch-making invention or discovery, or a book that has changed a mental climate.

So the word "event" in the title has been used in its dictionary meaning of an important occurrence of any description: in this sense the thought of Plato is as much an event as the Battle of Stalingrad. I have also taken as an event any group of occurrences with such a unity of pattern and theme that from the viewpoint of historical effect they can be regarded as one event: into such a category fall the victories and martyrdom of Joan of Arc.

When you trawl from the oceans your catch is likely to be a big one; the editor's task has been not so much the catching as the inspecting and discarding. Much of the catch has had to go overboard again, but it is hoped that what remains will have merited inclusion. Inevitably, for no two people will make the same assessments, there will be some who disagree with some of the choices: so be it, as long as the overall result is stimulating.

One of the most striking things that emerges from such a

#### EDITOR'S NOTE

re-examination is what one might perhaps call "the quantum of uncertainty" at the heart of so many historical happenings. By this I mean that time and time again the destinies of mankind seem to have hinged on some quite fortuitous event or unpredictable decision. How different, for instance, might have been the pattern of European agriculture if there had been no Black Death? What would have been the effect on the history of France and Europe if Louis XVI had not decided to attempt escape in 1791, or had succeeded in escaping instead of being captured at Varennes? How might the development of the trade-union movement have been affected if Annie Besant had not decided to attend a certain meeting of the Fabian Society one June evening of 1888? Would there have been a war in 1914 if Franz Ferdinand's chauffeur had been informed of the change of itinerary that would have taken him away from the lurking assassin? One could go on indefinitely asking such questions, and I am sure the reader will do so on his journey through these pages.

In acknowledgment of the debt we owe to prehistoric man, and especially to those anonymous Neolithic geniuses whose inventions and discoveries we find in use at the dawn of history, a chapter has been added outlining these achievements.

JOHN CANNING

## *What Was Happening Before History Began*

### *Great Discoverers Whose Names We Shall Never Know*

WHAT COULD be more depressingly dull than the museum-cases filled with bits and pieces of flint? There they lie in their cotton-wool nests, each with a dusty label somewhere near, and it is hardly surprising that most visitors pass them by with nothing more than a hasty glance. They are so rough and colourless and so very much alike.

But wait a moment. What if we are told that these were the tools and implements with which our remote ancestors braved a harsh and pitiless world, and went no little way towards subduing it? This ugly lump, for instance: some ruffianly brute, whom we should be very loth to acknowledge even as a most distant forebear, held it in his fist, weighed it and played about with it, and then used it to crack a bone for its marrow or as a weapon against a marauding enemy or prowling beast. And this sharp little flake once tipped an arrow that the primeval hunter discharged against a deer fleeing through the forest glade, or even tried to pierce a mammoth's hide with it as the ponderous beast came within sight and range. And as for this, why, it was once held in a woman's hand, as she scraped the blood and grease from a skin that her hunter-mate had brought home, and out of which she contrived a garment to keep out the cold.

Looked at in this way, these grim old stones take on a very different appearance. They assume an interest, a charm even; nay, the right word is surely "romantic"!

Some of them are a hundred thousand years old, or even several hundred thousand. In the Olduvai Gorge, in Tanzania, fossilized bones have been dug out of the rock, that may have belonged to a man-ape or to one who was of human stock, and in association with them were crude stone tools which, as is evidenced by the remains of small game also present, had been used in the chase or in food-gathering forays. This creature may have lived as much as seven hundred thousand years ago. Similar stone implements have been found in practically every site so far discovered of the most ancient human occupation; and it is altogether appropriate, then,

that this earliest period of human history—a period which took up by far the greater part of the story—should be called the Palaeolithic or Old Stone Age.

For ages that defy the calculations of the geologists and archaeologists these were all that our ancestors had to make their way with, to hold their own, to use as the implements of progress. And how slow that progress was, and, we may be sure, with what setbacks and reversions and long periods of stagnation it must have been marked! There are no chronicles to tell us the story of those thousands upon thousands of years; all we have to go by is these flints of various shapes and sizes that have been picked out of gravel banks or dug out of the floors of the caves that once served our remoter ancestors as homes and places of refuge. And of this we may be sure, that the flint tools and weapons that have come down to us, even in the crudest forms, are very far from representing the earliest achievements of man in the sphere of culture.

So immensely ancient are some of them that they may well date from a time before man had begun to make use of fire. The first sure evidence of fire in connexion with man is, we are told, the presence of hearths in the Choukoutien caves not far from Peking, which are dated to about 350,000 years ago. This seems to have been exceptional. Elsewhere no such traces are found until many thousands of years later. In Africa, for instance, there is no sign of the use of fire earlier than 40,000 years ago.

And here we should recognize the distinction between the use of fire and its making. *Sinanthropus*, or Peking Man, knew how to keep himself warm when the cold winds blew from across the plains, but there is not the slightest reason to believe that he had learnt one of the ways of making a blaze. He captured it from a forest conflagration, or perhaps a volcanic eruption, and then strove desperately to prevent it from escaping from his grasp and going out. As recently as two thousand years ago there was in Ancient Rome a special band of dedicated women, the Virgins of Vesta, who were entrusted with just that—keeping the sacred flame burning on the national hearth for fear that if it went out of its own, dire disasters would befall the State. Perhaps the earliest evidence of fire-making as distinct from fire-using is the charred fire-stick that was found not long since in a cave at Krapina, in Yugoslavia, which may date from 100,000 years ago. If this be so, then Europeans were already in the van of culture!

With his bits and pieces of stone, that he made into hammers and axes, scrapers and knives, spears and arrow-heads, man faced



the glacial periods that for ages loaded the earth with a great burden of ice. In the warmer intervals he may have made some progress, but not very much, at least so far as we may judge. He was still a wanderer on the face of the earth, a hunter of small game, perhaps a fisher in the streams and rivers, an eager collector of berries and fruits growing wild, of grubs and insects and anything else that was found to be edible. With his stone axe he had learnt how to make a dug-out canoe, and with the same handy tool he cut down trees in the forests and provided himself with trunks and boughs which went into the construction of his shacks and helped to prop up the walls of his cave dwellings. His handling of fire had also made great strides, and he had learnt how to make his food more palatable and digestible by cooking it over the embers or roasting it on a stick held above the flames. Of his social organization we know next to nothing, and it may be supposed that he still roamed around in family groups, in which the dominant figure was the eldest, or the most powerful, male, who saw to it that no younger male should challenge his sexual prerogatives.

Was there anything else to show for the ages of toil and endurance and untold dangers? Yes, there was something that, as we look back, strikes us as of extraordinary value, of outrageous originality. Art had entered into the world.

In scores of caves in France and Spain and elsewhere we find the art galleries of prehistoric man. Far from the light of day, in deep recesses that can have been but dimly lit by torches of brushwood, the hunter-artists painted the flat surfaces with representations of animals and the men who were hunting them, and out of lumps of clay and pieces of soft stone modelled or carved figures of hugely corpulent and grossly misshaped women. Why did they do it? The pre-historians talk of magical rites designed to increase the fertility of man and beast and the chances of a successful hunt, but in the absence of any explanation from the primitive practitioners themselves we must continue to wonder at this most unexpected and extraordinary flowering of the artistic impulse.

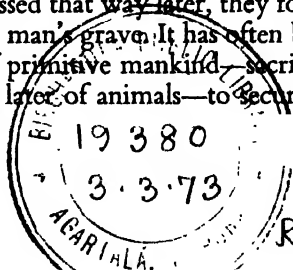
So the generations passed in untold ages of time. Ice Age followed upon Ice Age, each separated from the next by a period of comparative warmth and retreating glaciers and ice-floes. Mammoths and cave bears and woolly rhinoceroses wandered about Europe and northern Asia, and after their long day were submerged in endless night. Men—some sorts of men—watched them come, and saw them go, while they, so puny in comparison and yet so commandingly powerful with those nimble hands of theirs, those brains

packed with the mental machinery of progress, somehow managed to survive. At length the last of the ice sheets slowly withdrew towards the pole, and the human tribes followed their retreat, grew in numbers and resourcefulness, and on the cleared and fertilized expanses stepped out on the road of persistent if not always constant advance. The Old Stone Age reached its conclusion after so many aeons, and in the latter phases of the glacial period there emerged what is usually styled the Mesolithic or Middle Stone Age. And then the Neolithic or New Stone Age dawned.

Beyond all question, this was the most important period in the whole of human history. Proud as we are, and have every right to be, of the achievements of modern science and technology, we should do well to remind ourselves now and again that the really fundamental discoveries and inventions on which our civilization is based were all made before the dawn of written history. This is something that we owe to the memory of the forgotten pioneers who, with so little accumulated experience to go on, with no capital stored up but living always from hand to mouth, with no records of what had gone before, ventured and explored and experimented.

This was the first of the economic revolutions in human affairs. Very likely it was necessitated by the climatic changes that followed upon the retreat of the ice sheets. The big beasts of the older time that men had pursued and killed withdrew from the now wet and forested lands, which in Europe, at least, now yielded few good food plants. The hunters were in a quandary, but the brighter spirits among them solved the increasingly pressing problem of survival by the invention of agriculture. Both wheat and barley grew wild in north-eastern Africa and south-western Asia, and it was in this region, or some parts of it, that the cultivation of cereals began.

If only we knew who took the first steps, and how! Perhaps women looking for food in the valleys, grubbing about with their sticks, accidentally cleared a little field on which they were surprised to find, months later, wheat stalks growing. In their slow-moving minds they may have associated the ideas of digging and plant growth, and they copied the example given to them by Nature, with surprisingly successful results. Or it may have been that some grains of corn were buried with some Old Man of the Tribe, and, lo and behold, when the tribesfolk passed that way later, they found green shoots sprouting from the dead man's grave. It has often been suggested that the spring sacrifices of primitive mankind—sacrifices that were once of human beings but later of animals—to secure an



abundant crop, had their origin in some such accidental occurrence as this.

The first agricultural implement was a stick, pointed and perhaps hardened in the fire. The wooden digging-stick became a spade, and with a sharp stone tied on its end it was the ancestor of the hoe. The first plough is supposed to have been such a stone-tipped stick dragged through the soil, and it was surely a genius who had the happy idea of getting an animal—an ox, for instance—to do the heavy work for him. When the grain was ripe for harvesting it was cut by a stone that happened to be shaped like a sickle. By this time, it should be noted, men had developed the art of grinding and polishing stones, such as granite and diorite, and were no longer confined to the use of flints. The polished stone axe is, indeed, the most characteristic implement of the Neolithic Age.

The patient, slow-moving oxen were among the first of the animals to become domesticated, but priority must surely be accorded to the dog. He probably did not wait to be domesticated, but took the first steps in that direction himself. He hung about the tail of the nomad tribe, and did good work as a scavenger. Soon he had showed what he could do as an ally in the hunting-field and as a watchdog. He was found eminently useful in rounding up the wild sheep, and in keeping them in their fold at night. These folds were enclosures ringed with thorn bushes, but in course of time men planned and executed the vast earthworks that dot the downlands of England and many another country. Into these the sheep and cattle were driven at night; and while beside the entrance men and women huddled around the camp fire, the dogs sat above on the ramparts with ears pricked and noses alert for the approach of wolves and bears.

Among the most important of the consequences of the sowing of grain was the necessity for remaining in the neighbourhood, or at least of returning to it, when the harvest time drew near. From being a restless hunter, always on the move, man began to settle down. A house became a necessity, since it was intended to remain in the locality in winter as in summer. The idea of Home had come into the world—a place where young and old lived together, where the food grains were stored and the young animals penned, a place with happy memories of feasting and mating and general merry-making. And not far away was the group of mounds beneath which the honoured dead were sleeping their last sleep.

The storage of grain necessitated containers. Up to now a hollowed-out log had served well enough, but the time had come for

something more convenient and efficient. The first pot was probably a lump of clay into which the primitive inventor had forced his fist, but soon he began to appreciate the extraordinary malleability of this substance which, in some inexplicable way, took on a hardness when left for a time in the embers of the fire. The first potters must have found their activity particularly satisfying, as they smoothed and pummelled and twisted the soft clay, and with a view to adding to the attractiveness of their handiwork they impressed it with their finger-nails. So the first ornament was imparted by human hands.

Mining of a sort there had been in the Old Stone Age, since men dug down into the chalk in search of the flints that were their implements and weapons. Here and there, as at Grimes Graves in Norfolk, we may descend into the galleries that the early miners cut, and perhaps we may come across traces of their lamps and broken bits of their primitive tools. Sometimes, too, the bones have been found of some unlucky miners who were buried alive when the walls caved in. But in Neolithic times men began to search methodically for the ores of copper and tin, gold and silver, and meteoric iron. These may well have caught their attention first when tiny streams of metal trickled from ore-containing stones that had been placed round the fire on the hearth. At first the ingots may have been employed as jewellery only, or as magical charms, but ere long it was found that they had other uses of greater import. Tools of metal were made which cut better than the stone ones, and swords took the place of stone axes. The man who could tame fire and employ it to melt the rocks and make them disgorge their metal content was held in high honour, mixed with not a little suspicion of his magical powers.

Yet another of the basic discoveries of the New Stone Age was the manufacture of some sort of cloth out of the fleece of sheep, the hair of goats and cattle, etc. Palaeolithic Man had dressed in skins save when, as was perhaps generally the case, he went about naked. The preparation of the skins was women's work. After the hide had been stripped off the slaughtered beast the women scraped it of the blood and grease, pounded it with heavy stones, dried it in the sun or before the fire, and then softened it with their hands or by chewing it in their mouths. When it was realized that the wool off a sheep's back might make a more satisfactory covering than the sheepskin, the women again were to the front. In Neolithic times, as up to only a century or so ago, the woman was the spinster, and very likely the weaver too. She may have got the idea of warp and

woof from the interlacing of twigs to make a basket, for this craft was yet another of the many jobs that fell to woman's share.

Probably the most important of the single inventions that date from the New Stone Age was the wheel. From time immemorial men had shifted heavy loads on rollers made of logs of wood, and the huge stones employed in the construction of Stonehenge and other megalithic monuments were transported in this way. Then some keen-witted observer—although there is no reason to suppose that this or any other of the great inventions was made by only one man, at only one time, in only one place—may well have hit upon the idea of reducing the weight by paring away the middle of the roller. In the first carts or wagons to be built axle and wheels formed one solid piece, which revolved underneath the body, or chassis as we should say. The next step was the separation of axle from the wheels, so that the former remained fixed to the body while only the latter went round. So simple—but it must have taken more than one stroke of genius to discover it.

Turning from land to water, the first boats were dug-out logs and rafts made of boughs and branches. The use of skins laid over a frame of wattle was a great advance, and a greater still was the employment of a skin as the first sail. The first fishermen used spears, but as early as the last phase of the Old Stone Age men seem to have employed fish-hooks made of bone and barbed like antlers.

These, then, are some of the achievements of the peoples who lived in the centuries following upon the retreat of the ice, the men of the Neolithic Age. Of the many other things that might be advanced to their credit, perhaps the one which most deserves mention is irrigation, because this involves something that has not yet been referred to in this summary of achievement. Agriculture, domestication of animals, pottery, metal-working and the rest—all these might have developed, and probably did, in small groups. But irrigation is one of those things that one man cannot do on his own, one family even, or one tribe. It requires forethought, careful planning, the devotion of means to ends, the subordination of individual interests to the good of the community, which means some sort of government.

The men who tamed the floods of the Nile Valley and mastered the swamps of the Mesopotamian "land between the rivers" were far removed from the prehistoric hunters and food-gatherers. No longer was each man a law unto himself. The idea of a common purpose had come into the world. Collections of temporary shacks had become permanent villages, some of which were well on the

way to becoming towns. There was division of labour not just between the sexes but between agriculturists and smiths, potters and metal-workers, herdsmen and shepherds, fishermen and daring venturers in boats. And no longer was every man as good as the next man. Some men were acknowledged as wiser and more experienced, some were acquainted not only with the mysterious happenings of the river's rise and the flow of the sea, but with the motions of the stars, the sun and moon. Some men also were better off than others, lived in substantial houses, had storerooms filled with grain, owned fields outside the gate, while their womenfolk wore necklaces of jet and amber or bits of bright metal. Class distinctions had made their bow.

And another thing, even more important. There were some men who had invented signs with which, so they asserted, they could communicate with one another even at a great distance. These signs they inscribed on flat surfaces of stone, and with wedge-shaped pieces of stick on little tablets of wet clay. That turned out to be the most revolutionary invention of all that were to come. But it would not have been possible without the experimental fumbings, the innumerable false starts, the mistakes and disasters, the setbacks . . . of the men of the New Stone Age. They hadn't the least idea of what they were doing, but they did it extremely well.

# *The Code of Hammurabi*

## *Ancestor of Modern Law*

WHERE DID men first live together in cities, as citizens? Where, in other words, did civilization begin? Practically everybody who has studied the matter has concluded that it was somewhere in that "Fertile Crescent" that joins Africa to Asia in a great curve of green lowlands; but while some hold that priority should be given to the Nile Valley, others are of the opinion that the more likely place is that other great river valley that is to-day comprised within Iraq but is still better known, perhaps, as Mesopotamia.

That is what the Greeks called it, and the name is thoroughly well chosen: *The Land between the Rivers*—the rivers in question being the Euphrates and the Tigris. Now and for a long time past the two have discharged their waters into the Persian Gulf through a single mouth, the Shatt el-Arab, but in ancient times each had its own mouth, and the Gulf reached much farther inland than at present. Slowly, but appreciably, the land is encroaching on the sea—seventy feet a year, it has been estimated—for the two great streams bring with them from their mountainous sources immense quantities of silt which push back, as it were, the sea, year by year, and so they have been doing for uncountable ages past. A great deal of this silt, however, is dropped on the way, and the whole vast plain through which the rivers flow has been built up in this fashion. It is on this fertilizing layer that the prosperity of the region depends, and has depended from the beginning.

This plain is one of the most fertile places in the whole world, and as such was peopled very early on in the human story. There are relics of Stone Age occupation, but the first invaders of whom we have any real trace were the Sumerians, a white-skinned race who arrived in the land almost certainly before 5000 B.C. They were mountaineers from somewhere in the heart of central Asia, and when they emerged on to the vast flat expanse they must have been astounded by the contrast with their homeland.

They colonized the lower part of the plain, what in after centuries became known as Babylonia, and their little towns or cities were

built on the islands of slightly higher ground which were not liable to the annual floods. Out of hard and bitter experience they learnt how to control in some measure the waters, and round their settlements they planted fields of wheat and barley, which grew there marvellously well. They also had their religion, and they built little temples on the tops of mounds, each with its tower in which the god was supposed to dwell. It would seem that they built these towers as high as possible in order that the gods, who had been used to mountain dwellings in their former country, might feel more at home.

In the northern part of the plain another people arrived and settled. These were of a different race and origin; they were Semites, and it has been surmised that they came from somewhere near the Mediterranean coast. The part of the plain that they occupied became known as Akkad, and for a long time there was rivalry and frequently war between the dwellers in the south and the north. But the civilization in Akkad and Babylonia was very much alike. Each had its basis in cities—although we must not read too much into that term: the biggest of the Mesopotamian cities could hardly rival an English village or small country town. Each of the cities had its *patesi* or priest-king, its upper class and lower classes, its officials and businessmen, its artisans and labourers in the fields and on the dykes and irrigation ditches. Each, too, had its army, its temple and attendant priests, its lawcourts and its prison. In these little mud-walled centres of busy life, systems of law and theology were worked out, ambitions found their scope, and in the more important cities—such as Nippur, Lagash, Eridu, and Ur in Sumeria, and Kish (the oldest city in the world?), Sippar, Agade, and Babylon in Akkad—dynasties of kings flourished with fantastic names and who were alleged to have had fantastically long reigns.

Rather more than two thousand years B.C. the northern group seem to have been overrun by a fresh wave of Semitic invaders, belonging to the Amorite family of nations, and some hundreds of years later there arose at Babylon a monarch whose name bulks large in ancient history. This was Hammurabi, and the period of his flourishing may have been as early as 2285 B.C. or (and this seems more probable) as late as 1750 B.C. Whenever it was, there is no doubt of Hammurabi's achievement. He not only established his rule over the whole of Akkad but he brought within his empire—the word is surely permissible—the group of city-states in the Sumerian region to the south. All the ancient records that have been preserved speak well of him; as one of the inscriptions puts it, “he



put order and righteousness in the land". Several of his letters (written in cuneiform characters on little tablets of baked clay) have been preserved, and in these he shows a laudable concern about the state of the canals and other matters of his people's welfare. "I gathered the scattered people of Sumer and Akkad," reads one of his inscriptions; "with pasturage and watering I provided them. I pastured them with plenty and abundance, and settled them in peaceful dwellings." But his fame does not rest on these things, however great and estimable, but on his Code of Laws.

For our knowledge of this we are indebted to the discovery by a band of French archaeologists, working on the site of the ancient Persian city of Susa in the winter of 1901, of an upright stone slab or pillar, technically known as a stele, on which the "laws" are engraved in twenty-one columns of writing in cuneiform script. At the top of the stele Hammurabi is represented receiving the laws from Shamash the Sun-god, who was also the god of Justice in heaven and on earth, and the inscription concludes with a vigorous curse on any man who "heeds not the words that I have engraved on my pillar, scorns my curses and fears not the curse of God, if he has annulled the law that I have given, or altered my words, or changed my inscription, or erased my name in order to make room for his own . . . may the great god Anu, the father of gods, extinguish the glory of his throne, may he shatter his sceptre, may he curse his end!"

How the pillar got to Susa is still a mystery, but it is surmised that originally it was set up by Hammurabi in the temple of the god Marduk in Babylon, so that it might be consulted by any man who wanted to know what the law was on any matter that concerned him; that it remained there for a thousand years or so, until a king of Elam overran Babylonia and removed the pillar to his own land as one of the spoils of victory and set it up in a temple in Susa. There, after some long time, it got buried in the rubble when the city was sacked and destroyed by an invader, and so it remained until the French archaeologists discovered it and restored it to the light of day. They took it back with them to France, and ever since it has been one of the most treasured exhibits in the great national museum at the Louvre, in Paris. A very fine copy of it may be seen in the British Museum in London.

There are some two hundred and eighty-two "laws" decipherable on the column, but originally there were probably another thirty-five in a space at the bottom, which seems to have been cleared in order to make room for some enactments of the Elamite conqueror.

But these were never engraved on the pillar, for whatever reason we can only guess. Perhaps Hammurabi's curse had its effect!

On the face of it, the "laws" seem to be a very mixed bag. It is hard to discover any sort of order among them, and there are some very obvious gaps in the enactments, as, for instance, when punishments are prescribed for a man who steals from the great house of a noble or from a temple, and yet nothing is said of thefts from the ordinary citizen. But even so, the Code is of extraordinary interest and value, and throws a flood of light on the social and religious and political conditions in Babylonia all those many centuries ago.

The Code opens with the enactment that "if a man has thrown a curse upon another man, and it is not justified, the layer of the curse shall be slain". The second is similar, recalling the witch-finding ordeals practised in this country up to a couple of centuries ago. But then come a number of laws having to do with matters of practical ethics and morality. A man who has harboured a fugitive slave shall be slain, but he who apprehends one in his field and takes him back to his master shall be suitably rewarded. A man who out of laziness has neglected to repair his dyke, with the result that his neighbour's field is flooded, shall make good the latter's loss. A man who is caught breaking into a house, shall be slain in the breach he has made in the wall, and shall be buried there. If a fire breaks out, and one of the fire-fighters seizes the opportunity of stealing some of the victim's goods, he shall be thrown himself into the blaze. If plotters against the state meet in the house of a wine-seller, and she does not seize them and deliver them up to the "great house", she shall be slain.

If a priestess slips out of her convent and enters a wine-shop for a drink, she shall be burned alive. A man who has contracted a debt and cannot otherwise pay, may sell his wife, his son or his daughter, as slaves, for a period of three years to his creditor—after which time they shall be allowed to return home and the debt will be liquidated. If a man's wife is taken in adultery, she and her lover shall be bound together and thrown into the river—"unless the husband lets his wife live, and the king lets his servant live". A man may divorce his wife should she prove barren, but he must return her dowry before she goes back to her father's house. If, however, a wife mismanages the house and neglects her husband, all he has to do is to say, "thou art divorced", and she must return to her father and her husband is under no obligation to return her dowry or bride-price.

If a man's wife falls sick and he wants to marry another, he shall

not be allowed to divorce her, but must maintain her in his house as long as she lives. If a man lifts up his hand against his father, and strikes him, his hands shall be cut off. If he has knocked out the eye of a fellow-citizen, his own eye shall be destroyed; if he has knocked out a slave's eye or broken one of his bones, he shall pay half the slave's value to his owner. If a builder builds a house for a citizen, and the house falls down through bad workmanship, and kills the householder, that builder shall be slain. Likewise, if a doctor treats a man with a metal knife for a severe wound, and the patient dies during the operation, the doctor's hands shall be cut off—presumably to prevent his making a similar mistake again. Then there is this choice little "law": If a mad bull meet a man in the highway, and gore him so that he dies, that case has no remedy.

Such was the justice in Hammurabi's Babylon, and rough and ready some of it must appear to us. But this apart, the Code tells us a very great deal about the society of the time. Obviously it was one of a quite advanced type. We read of citizens, who are called *Amelu*; of a kind of middle or lower class, the *Mushkenu*; and as the foundation of the social edifice, a class of slaves, or *Wardu*. Slavery was a recognized institution, it is clear, but even the slave had rights, and could not be ill-treated with impunity. As almost everywhere else, in all ages, the society was male-dominated, the laws were made by men for men's advantage; but the wife was no mere chattel, marriage was a solemn business transaction which, like other business transactions, had to be put into writing, and if a wife were ill-treated she might claim the restoration of her dowry before returning to her father's house. When a man died, his widow could claim a share in his property equally with his son. A slave-girl might be taken in lawful matrimony, in which case when her husband died both she and any children she had borne him should be emancipated. Then in the economic sphere, the society was one in which there were various classes, rich people and poor people and lots of people in between; a number of industrial occupations were practised, and the professions, too, had their representatives, doctors and lawyers in particular.

Religion was a prominent feature; there seem to have been a number of temples dedicated to the worship of the various gods and goddesses of the Babylonian pantheon, each with its establishment of priests and priestesses living in convents and possessed of large properties. And then, above all, was the government headed by the king who may also have been the chief priest, thus combining in one person the formidable powers of Church and State.

Quite clearly, we are observing a state of affairs very far removed from the culture of the latest of the Stone Ages, when men for the first time came together in settled communities and took the first giant strides towards civilization. Civilization, it is plain, had been in being for centuries, even thousands of years, for such social rules and regulations as we have noticed cannot have sprung up overnight, as it were. They were the outcome of generations of experiment and experience of living together in close proximity and co-operation in all the walks of life.

Out of such living together, the need for Law arose. Where there is property, there must be someone to make laws against theft, and with power to see that they are enforced. Where social classes have grown up, there must be someone to keep the peace between them, and to ensure that they do not overstep their boundaries. Where religious rights are involved, and there may arise a conflict of loyalties between the gods' servants and the king's, it must be clearly laid down which should have the preference. Thus it was for an amazingly complex society that King Hammurabi drew up his Code.

Sometimes it is urged that he was not the originator of the Code but that he merely collected all the laws that had come down from his predecessors and revised and re-stated them. But this does not detract from his achievement. He it was who saw the necessity for a stable and generally accepted code, and he it was who framed the code and established it and made it work. What if fragments of earlier codes have been discovered in the ancient ruins? They are but fragments, not to be compared with Hammurabi's masterpiece. When all is said, his pre-eminence is assured as the greatest of the Lawgivers of the ancient world, and his Code is the ancestor of the laws administered in all the subsequent civilizations up to our own time.

In imagination, then, we may see the great king giving a fair copy of the Laws to his sculptors to engrave on the pillar that had been made ready, and watching them as they made the wedge-shaped marks on the hard stone. Then when they had finished, he supervised its transport and erection in the temple he had chosen. No doubt there was something in the nature of an unveiling or dedication. It was a great day in the history of Babylonia, and one that we may well recall, for in this as in so many other things that have entered into our civilization, it was Babylonia that pointed the way and indicated the path of progress.

## *The Belief of Akhnaton*

### *The Introduction of a New Note into the Religious Thought of the World*

HE HAS been called the first Individual in human history, the young man who succeeded his father on the throne of Egypt in about 1375 B.C. as the fourth of the Amenhoteps, and in the course of a reign of something less than twenty years became greatly renowned, deeply revered, and finally intensely reviled. Beyond any question he was the strangest, the most remarkable, of the long line of Pharaohs, but he has something more than individuality to commend him to the remembrance of posterity. He was a man out of his time, and as such he paid the price of his originality. His career has a significance that may well preserve his name as long as honesty of purpose and wholehearted devotion to Truth are held in honour.

When he became Pharaoh, Egyptian civilization was already immensely old. Some two thousand years separated Amenhotep IV, as was his style when he ascended the throne, from Menes, the traditional founder of the 1st Dynasty, and there had been kings in Upper and Lower Egypt for long before Menes. The Pyramids, those most vainglorious monuments to human pride, were more than a thousand years old when the young king drove past them in his chariot. The Old Kingdom, as it is called, had given place to the Middle Kingdom, which in turn had handed on the torch to the New Kingdom. Now was the time of the 18th Dynasty, and Egypt flourished as never before and seldom if ever since. The Amenhoteps and Thothmes who followed one another in alternate succession were all men of capacity, and some of them outstandingly so. Thothmes III, for instance, has been called the Napoleon of Egypt on account of the thirty or so campaigns in which the Egyptian arms were carried in triumph to Nubia in the far south and to the borders of Armenia in the yet more distant north-east. Then there was Amenhotep III, who well deserved his style of Amenhotep the Magnificent. He was a big man, in physique and personality and achievement, the most splendid of all the Pharaohs. He was the father of the young man whose career we are about

to follow, and it may well be that the fame of the parent cast a depressing shadow on the life of the son.

There are tantalizing gaps in the story, the dates (like all, or nearly all, Egyptian dates) are uncertain, and the accounts are sometimes difficult to reconcile. Surely Amenhotep must have been more than eleven when he ascended the throne, which is what one of the sources alleges? There is no doubt that he was young, however, too young for the duties and responsibilities that now fell on his shoulders.

As fate would have it, a period of instability had set in on the Egyptian frontiers in Asia. Resentment at the Pharaoh's rule had been steadily growing, and now it had reached boiling-point. There were plots and insurrections, and the Egyptian governors were hard put to it to hold their own. By a fortunate chance we know a great deal about this particular period, for in 1888 there happened to be discovered at Tell el-Amarna, on the site of the Royal Record Office, some three hundred tablets which turned out to be letters addressed to the Pharaoh Amenhotep III and to his son by their vassal kings in Syria and Palestine, and the kings of Babylonia, Nineveh, Mitanni, and other states in friendly relationship with Egypt. In large measure they are appeals for help. The old Amenhotep had turned a deaf ear to the appeals and complaints: no doubt he was getting tired, and had lost the energy that had characterized his prime. But now he had been succeeded by a young man of promise: surely he would act differently? Surely they might expect him to take the field at the head of his troops and restore his empire's old-time power?

But it soon transpired that the new Pharaoh had other interests and ideas. He seems to have discarded his father's trusted counsellors, and was very much under the influence of two women—his mother Queen Tiy and his wife Nefertiti, about whom little is known but who may have been of Asiatic birth. These two, with a priest who was the husband of his old nurse, formed his immediate circle; and though they may have been highly gifted, they were not the kind of advisers that the Pharaoh was most in need of, when the storm clouds were gathering on distant horizons and the soldiers and men of affairs were clamouring for action.

Amenhotep refused to listen. Theology was what interested him, rather than politics; and now he embarked on a course of action that brought him into direct conflict with that most powerful of Egyptian institutions, the State Church, or rather the priesthood who were its ministers.

The Egyptians had always been a most religious people. They were polytheists, and the gods and goddesses of their pantheon were legion. There were gods of the earth and gods of the sky, and there were gods who were a mixture of the human and the animal. As the centuries rolled on, new divinities were discovered or invented, and the number grew to such an unmanageable extent that from time to time attempts were made to bring some order out of the theological chaos. Some gods were identified with others, and the greater gods were formed into triads, of father-god, mother-god, and child-god. If there was a chief among the crowd of divinities, it was the Sun-god Ra, the centre of whose worship was at Heliopolis, in the Delta; Ra was visualized as king in heaven, the regulator of the seasons, the bringer of light and dark, and one of the titles given to the Pharaoh was "Son of Ra". Out of consideration for local susceptibilities, it became customary to associate another god with Ra, and of these the most important was Amen (or Amon), who had been originally the city god of Thebes, in the days of the Old Kingdom. As Thebes grew in importance and at length became the imperial capital, Amen-Ra was acknowledged as the bringer of victory to the armies of Pharaoh. As such, he received as a matter of course a large share of the spoils of victory, and his priests in consequence became immensely rich and influential.

An indication of the god's importance is afforded by the name Amenhotep, meaning "Amen is content". But Amenhotep IV was far from content. He deplored the intimate association of Ra with a local god. To him it had been revealed, he declared, by the god himself, that Ra was the Supreme Deity, with no equal or associate, and it was therefore blasphemous to join his name with any other of the supposed manifestations of the Divine. To emphasize his unique glory, Ra was now given the new name of Aton, "the disc of the sun", and he was represented in symbolic form as the sun disc beneath the vault of the sky, with broad rays like arms ending in human hands reaching down from the lower edge of the disc to embrace his worshippers. At the same time the Pharaoh changed his name from Amenhotep to that under which he has become immortal—Akhnaton (or Ikhnaton), meaning "The Spirit of Aton". He proceeded to build temples in which Aton should be worshipped, and, whether for the temple services or for his personal devotions, he composed hymns which are perhaps the most remarkable of the surviving monuments of this revolution in ideas. These hymns are entitled "Praise of Aton by King Akhnaton and Queen Nefertiti", and one in particular is deservedly renowned.

"Thou fillest the two lands [Egypt] with thy love," runs one passage; "thou good ruler who didst make every land and everything that is in it, mankind, herds and flocks, and all kinds of trees that grow on the soil. These live when thou risest in the heavens. Thou art father and mother to all that thou hast made. . . . When thou settest in the western horizon of heaven, the earth becomes dark with the darkness of the dead. Men fall asleep in their houses, their heads are covered up, their nostrils stopped, and no man can see his neighbour; everything that they possess could be stolen from them without their knowing anything about it. Then it is that the lions come forth from their lairs, every creeping thing that biteth, the smithy is in darkness, and all the earth is silent because he who made all creatures resteth in his horizon.

"But when the dawn breaks, when thou awakest and goest up on the horizon, thou drivest away the darkness with thy rays. Then the people of the Two Lands rise up and stand upon their feet. They wash their bodies and take their clothes, and stretch out their hands to thee in thanksgiving for thy rising . . ."

"How manifold are all thy works!" runs another verse, "they are hidden from us, O thou sole God, beside whom there is no other. . . . Thou makest the seasons, the cool of winter and the heat of summer. Thou art he who createst the man-child in woman, the seed in man, who giveth life to the son in the body of his mother. To the chick within the egg thou givest breath, and when thou hast perfected him he breaks the shell and comes forth chirping with all his might and runs on his feet. . . . It was thou who set the Nile in the Underworld, and another Nile in the sky to water the earth with rain. The countries of Syria and Nubia, the land of Egypt—thou madest them all; thou hast appointed each man to his place and provided him with everything that he needs . . ."

Here indeed is a new note in the religious thought of the world. A new spirit of universalism has been born; out of the dry bones of most ancient Egypt has sprung vigorous young life. It is no mere State god that Akhnaton is hymning, no god of Egypt alone, but one who has made all the earth and all the people in it, "Aton, the father and mother of all that he hath made". This sublime conception is familiar to us from the Old Testament prophets, but Akhnaton preceded them in time by seven or eight centuries. The wonder of it, the inexplicable originality, the extraordinary depth and sweep of the royal singer's vision. . . .

One of the names which the Pharaoh had assumed when, as a youth, he had ascended the throne, was "He that lives in truth",



and this might well be taken as the motto of his life. Surrounded by the vast wealth and luxury of an imperial court, he displayed a charming simplicity, an unconventional directness and openness. He often appeared in public with his wife and little daughters—he had no son. On the monuments he is sometimes shown with Nefertiti sitting in his lap, or the king and queen are seated on chairs facing one another. The princesses are shown climbing on his knee, or, dressed in little but their necklaces, they are sitting on cushions at their parents' feet.

A still greater break with traditional conventions is the way in which the king is portrayed. Here is no stylized representation such as his predecessors had insisted upon, but an uninhibited, even a rather cruel, naturalness. The high, narrow, somewhat receding forehead—the large aquiline nose—the thin mouth and projecting chin—the almost feminine roundness of his figure: these are the components of a portrait that he must have commissioned and approved. As the years passed, his looks degenerated, and some have seen in the representations the indications of a pathological subject. As for Queen Nefertiti, we know what she looked like from the painted limestone head that was discovered in the sculptor's workshop at the city that her husband built—not beautiful perhaps, but strikingly handsome and full of queenly dignity and grace. She, likewise, was very decidedly a character, an individual, a fit sharer of her husband's dreams and schemes.

How good it is to know that Akhnaton was so happy in his home life, since there was so much to trouble him in the world outside. His innovations were bitterly resisted, naturally enough, by all those with a vested interest in the old order, and they were many. At length the idealist became the persecutor. The official temple-worship of the various gods throughout the land was brought to a close. The priesthoods were deprived of their great possessions. And so intense was Akhnaton's jealous hatred of Aton's possible rivals that he gave orders that their names should be erased from the inscriptions and monuments and wherever else they might be found. Not even the statue of his father in the great temple at Karnak was exempt.

Still Akhnaton had not completed his revolution. Since Thebes was so indissolubly connected with the old religion, the Pharaoh decided to abandon it and to create a new capital in its place. The site chosen was nearly three hundred miles down the Nile, and there, in a green pocket left by the receding cliffs, the city was built, complete with palaces and temples, government offices and

workshops, villas for the officials and little cottages for the workers. To the city he gave the name of Akhetaton, which means "The Horizon of Aton", and to it was transferred the seat of the imperial government. Here Akhnaton held court, and to his palace came the worried ambassadors and the despairing messages from his officers in the distant parts of the Empire who were beset by foreign foes. The Pharaoh seemed to be far too busy with his building plans and religious schemes to pay them much attention. Among the collection of Amarna Letters one may find such as this: "For twenty years we have been sending to our lord the King of Egypt, but there has not come to us a word, not one." And this: "There remains not one prince to my lord the King, every one is ruined. Let the King take care of his land and send troops, for if no troops come this year, the whole territory of my lord the King will perish."

The appeals went unheeded; no troops were sent, and everywhere the enemies of Pharaoh made headway. Akhnaton, though still young in years, was ageing fast, and, if his portraits are anything to go by, some sort of physical and perhaps mental deterioration had set in. Still he clung to his monotheistic beliefs, however, and it was as a devout servant of the one true god Aton that he died. This was in 1358 B.C.

Hardly had his embalmed body been laid in the tomb that had been made ready for it, when the counter-revolution started. Since he had no son he was succeeded by Sakere, who had married one of his daughters, and he, after the briefest of reigns, was followed by Tutankhaten, the husband of another of the princesses. His reign, too, was short, but it saw the return of Egypt to the worship of Amen-Ra and the other ancient gods, and we can hardly over-estimate the significance of the King's change of name to Tutankhamen. . . . The city of Akhetaton was allowed to go into ruin, as the Pharaoh moved his court and capital back to Thebes. To-day the town of Tell el-Amarna occupies the place where it stood.

Tutankhamen took Akhnaton's gold-wrapped mummy back with him to Thebes and placed it in the tomb of Queen Tiy (where it lay undisturbed until 1907, when it was discovered by a band of archaeologists working on behalf of the Egyptian Government, fifteen years before Howard Carter broke through the defences of Tutankhamen's superlatively magnificent tomb). This was an act of filial piety, but by this time men might say what they liked about the dead Pharaoh. His memory was execrated. He was the "heretic Pharaoh", he was the "Criminal of Akhetaton". He was the man who had let an empire slip through his fingers, and by his fanatical

zeal had disrupted the social order and wrought havoc among the gods.

Posterity has taken a kinder view of the young Pharaoh. It sees in him a brave soul, a spirit such as the world had not seen up to his time and has seen but seldom since. An idealist who lived in and for Truth, the man who emerges from the crowd of Pharaohs as the first great individual, and even more important, the man who first proclaimed before all the world the sublime conception of the Oneness of the Godhead.

## *The Founding of Rome*

### *The Foundation also of Modern European Civilization*

WHEN THE Roman Empire was at the fullest extent of its power and influence— at the beginning of the second century A.D.—Roman rule extended over Britain, the whole of modern Belgium, France and Spain, Switzerland, parts of western and southern Germany, Austria, Yugoslavia, Czechoslovakia, Rumania, Greece, Bulgaria, Hungary, the Crimea, Asia Minor, Syria, Jordan and Palestine, Egypt and all North Africa from the western frontier of Egypt to the Atlantic coastline of modern Morocco, as well as over the whole of Italy and all the Mediterranean islands.

Roman customs, Roman laws, Roman thought and the Latin language were the dominating influences in two-thirds of Europe, throughout the Near East and along the whole of the Mediterranean seaboard of North Africa. No other imperial power in the entire history of Europe has ever influenced so much of the continent; and because of the later extension of European interests in the ancient world of India and the new world of the Americas, to the far eastern edges of the world and throughout the vast continent of Africa, the imprint of Roman culture has at one time or another been stamped upon more than half the globe.

Viewed merely as a national accomplishment, the Roman achievement still has the ability to make one catch one's breath. Yet when one considers the beginnings from which Rome sprang, it becomes even more fantastic.

The foundation of the city of Rome is buried deep in legend. This is not surprising when it is remembered that in the thousand years before the birth of Christ, the historians of western Europe, unlike their Jewish contemporaries in Palestine, for example, recorded their work in the spoken or sung word, and not in writing; the reason being that the high level of civilization achieved by the Jews and the Greeks had not yet been attained by the inhabitants on "the western fringe of the world".

Be this as it may, modern archaeologists have produced traces of evidence which indicate that in several respects the legend has a

basis in fact. For example, legend has always claimed that the city was founded in 753 B.C., and remains have been discovered that show that this date is not far wide of the mark.

When Livy, the most famous of all Roman historians, embarked upon his *History of Rome from its Foundations*—which he was to complete in 142 books—round about 20 B.C., he was quite content to record the legend in his account of the founding of the city.

He justifies himself thus: "Events that happened before Rome was born or even thought of, have been handed down to us in ancient stories which have more of the charm of poetry about them than sound historical content, and such traditions I do not propose either to accept as true or to reject them. When antiquity makes no clear distinction between the human and the supernatural I do not see any reason why one should object to tradition: for it endows the past with a certain dignity, and if any nation has a right to claim divine ancestry, that nation is ours; and so great has been the glory which the Romans have won in their wars that when they declare that Mars (the god of War) was their first parent and the father of the man who founded their city, all the nations of the world may grant their claim with the same readiness with which they accept Rome's imperial dominion."

The version of the legend which Livy recounted was this:

The story of the kidnapping of Helen by Paris of Troy and the Trojan War which followed—also legend to a very great extent—is too well known to need to be described. The Greeks, it will be recalled, eventually won the war after a ten years' siege and burnt Troy to the ground.

Among the refugees who escaped from the disaster was a man called Aeneas, who took with him his father Anchises, whose mother had been Venus, the goddess of Love. With Aeneas went a small company of fellow-citizens. After many years of wanderings, Aeneas was driven by a storm to Carthage, whose queen, Dido, fell deeply in love with him.

In the circumstances, one would have thought that Aeneas would have been eager to settle down to the comfortable life which being the queen's favourite would have afforded him; but he was too restless, and after a time abandoned Dido, who committed suicide, and set off again on his wanderings.

First he reached Sicily, but found there nothing to commend the place to him, so he embarked again, and sailed for the mainland of Italy, where he landed in the territory called Laurentum. In their travels, Aeneas's men had lost all their possessions except their

swords; so, once on shore, they set about searching for what they could find, and while they were engaged in this they met a force of armed natives led by their king, Latinus.

"There are", says Livy, "two versions of what happened next. According to one, there was a fight ending in the defeat of Latinus who then came to terms with Aeneas and gave him his daughter for wife. According to the other, as the battle was about to begin, Latinus came forward and suggested talks."

Curious about the strangers, Latinus asked Aeneas who he was and where he had come from, and when he heard their story said that he had no objection to the Trojans settling in his territory, and offered Aeneas friendship. Aeneas accepted the offer and the gift of Latinus's daughter as a wife.

The Trojans were now prepared to believe that they had at last found a permanent home. They settled down and built a settlement, which Aeneas called Lavinium, after his wife, Lavinia. A child was soon born—a boy who was given the name Ascanius.

Presently the Trojans and the Latins joined forces in a war against Turnus, prince of the Rutuli, to whom Lavinia had been pledged before Aeneas's arrival. Angered by the insult of losing his fiancée to a stranger, Turnus attacked the Trojans and the Latins. The Rutuli were defeated, but in the battle Latinus was killed.

Turnus had for some time been apprehensive about the growing power of the Trojan settlement, and, now anxious more than ever for the future, he looked about for an ally, and turned to Mezentius, king of the rich and powerful Etruscans, who needed little persuasion to join Turnus, because he too was jealous of the Trojans.

In order to rally his people, Aeneas declared that from henceforward his Trojans should call themselves Latins. This pleased the Latins so much that they readily accepted Aeneas as their king and leader. In a very short time the two peoples had become welded into one nation, and this gave Aeneas confidence to declare war on the Etruscans and their allies, despite their great strength.

As Livy puts it: "Etruria, indeed, had at this time both by sea and land filled the whole length of Italy from the Alps to Sicily with the noise of her name."

Nevertheless, Aeneas, refusing to put himself on the defensive, marched out to the attack. The Latins were victorious, but they lost their leader, Aeneas.

"He is buried on the banks of the river Numicus," says Livy, and asks, "Was he a man, or was he a god? Whatever he was, men call him Jupiter Indiges—the local Jove."

Ascanius was too young to take over the kingship, so his mother Lavinia, a woman of great personality and strong character, was appointed regent until her son came of age. By the time Ascanius came to the throne Lavinium was a populous, rich and flourishing town; but despite this, Ascanius handed it over into his mother's keeping and went off to found a new settlement on the Alban hills which, because it was strung out along a ridge, he called Alba Longa.

The Latins too had increased in strength and wealth and Mezentius and his Etruscans were less inclined to attack them than ever, so he proposed a treaty of non-aggression which defined the boundary between the two territories as lying along the course of the river Albula, soon to become known as the Tiber.

The years passed, and Ascanius was succeeded upon his death by his son, Aeneas Silvius, so named because he had been born "in the woods". From this time the kings of Alba all attached Silvius to their names.

Life and the times were violent, and kings of Alba succeeded one another in fairly quick succession, until Amulius murdered his brother and seized the throne, and then proceeded to kill off all his nephews; and to make quite certain that no descendant of his brother should rise up against him he appointed his only niece, Rhea Silvia, a Vestal, thus condemning her to perpetual virginity.

Despite these precautions, however, Rhea Silvia became pregnant, and in due course gave birth to twin boys. She declared that Mars, the god of War, was their father. "Perhaps she believed it," Livy comments, "or perhaps she was merely hoping that if she claimed that her violator was divine she could not be held guilty."

But it was in vain. King Amulius would not believe her, and ordered that she should be flung into prison, and the boys to be drowned in the Tiber. "But destiny", Livy remarks, "intervened."

The Tiber was in flood and it was impossible for the men detailed to get rid of the twins to reach the river proper, and they merely left the box containing the boys at the edge of the flood-water. When the water eventually subsided, it left the boys high and dry, and a she-wolf, hearing their cries and coming to investigate, realized that they were hungry and thirsty and suckled them.

While this was happening one of the king's herdsmen, Faustulus, came upon them, gathered up the boys and took them to his hut, where he gave them into the care of his wife, who named them Romulus and Remus.

The boys flourished and grew; they were lively youths, always up to some prank, and very partial to carrying out raids upon

their neighbours' cattle. Sometimes they were caught and punished, and on one such occasion, when Remus had been caught but his twin had been able to escape, Faustulus, who had always suspected the identity of the twins, told Romulus of his suspicions, who passed on the story to King Numitor, who had made Remus prisoner. Numitor was convinced of the truth of the story, and when Romulus suggested having revenge upon Amulius, agreed to help them.

Under Romulus's leadership, Amulius's palace was attacked and Amulius was killed, and Numitor became king also of Alba Longa, while the two boys decided to found a new settlement on the site at which Faustulus had found them with the she-wolf.

The plan had Numitor's blessing, for Alba Longa was by now over-populated. Unfortunately, the founding of the new settlement was marred by a disgraceful quarrel which sprang up between the twins as to who should govern. They decided to settle the problem by asking the gods to declare an augury, and took up their positions, Romulus on the Palatine hill and Remus on the Aventine hill, from which to watch the auspices.

But even when the signs were given, neither could accept them, and fighting broke out between the followers of the brothers. During the fracas, Remus, by way of taunting his twin, leapt over the half-built walls of the new settlement, whereupon Romulus, in uncontrollable rage, killed him, exclaiming: "So perish whoever else shall overleap my battlements."

Thus Romulus became king, and the new city took its name from him, and was called Rome.

"Romulus's first act", Livy records, "was to fortify the Palatine hill and then to offer sacrifices. . . . Having performed his religious duties with proper ceremony, he called his subjects to him and gave them laws. . . . In his view, the mob over whom he ruled could not be persuaded to observe the laws unless he himself adopted certain visible signs of power, so he proceeded to increase the dignity and impressiveness of his position by various devices, of which the most important was the creation of twelve lictors to attend his person."

Under Romulus's guidance, Rome grew rapidly, not only physically but in wealth and power, and in a very short time was in a position to challenge all her neighbours. There was only one thing which seemed to stand in the way of her continued greatness—the lack of women. Try as he might, Romulus could not persuade the women of the neighbouring tribes to marry with his men and had to fall back upon a somewhat desperate plan.



He organized a festival and invited the surrounding peoples. When the festivities were at their height, he gave a sign to his followers and each man seized a woman from among the daughters of their guests and carried her off. There were strong objections from the parents and the young women themselves made a show at least of resentment, but after a time all was straightened out, and the women settled down to become the mothers of the greatest nation of ancient times.

For with his menfolk happily married and the future generations assured, Romulus set out upon a campaign of subduing the neighbouring peoples, a campaign which was entirely successful. At the same time, he set up institutions of government upon a new pattern, which was to remain the basis of Roman government for as long as Rome's power lasted.

Livy relates the legend of Romulus's end thus: "One day while he was reviewing his troops on the Campus Martius near the marsh of Capra, a storm burst, with violent thunder. A cloud enveloped him, so thick that it hid him from the eyes of everyone present, and from that moment he was never seen again upon earth."

Romulus's successors, whether legendary or real, continued to exert their power over every tribe and nation within their reach, and as the years passed so their reach extended. Five hundred years from the founding of the city, the Romans controlled the whole of Italy, Sicily, Sardinia and Corsica, and from that time on they began to extend their rule throughout Europe until within a thousand years they wielded power over the vast territories named in the first paragraph.

By this time they had developed a civilization which was to leave everlasting traces on succeeding civilizations—in Europe at all events—down to the present day. Great law-givers, great administrators, great road-builders, a people of great refinement of taste, creators of a great literature, though not great artists nor outstanding architects, the people who sprang from the primitive settlement of the Palatine hill in 753 B.C. bequeathed a legacy to us to-day which is responsible for much of the richness of our own civilization.

So deep, in fact, go the Roman influences into our lives—our laws, our language, many of our institutions spring from the Roman models—that it is difficult to imagine what our lives would be without them.

## *The Dawn of the Scientific Method*

### *Thales and Democritus Change the Basis of Man's Thinking*

PHOEBUS WAS the sun: he wore brilliant robes, of gold, or red or purple—even green—often slipping on the red one as his daily chariot trip across the heavens ended, so that of a sudden the whole earth was bathed in rosy light. When the journey was over, and Phoebus had dismounted from his chariot, those with the blessing of the gods could visit him in his temple, find him sitting on his throne, a throne that sparkled and burnt with emeralds. On his right and left were the gods of the Day, the Month, the Year, the Century. Even the Hours, little fellows, were standing side by side, with exactly the same distance between each one and his fellow. Not only this: there was Spring in a robe of flowers; Summer garlanded with ears of golden corn, sheaves of wheat; Autumn with her dress stained purple from the juice of grapes; and scowling Winter, with his white, dishevelled hair. They held court each night, while the world slumbered. Then, in the morning, when the Moon-Goddess had ended her own nocturnal dash across the heavens, Phoebus would set off again, in his fiery chariot, galloping across the sky, while the others went about their business.

Of all this, there could be no doubt: for centuries, men had known it, been brought up with it, accepted it as fact. Any unusual behaviour in the heavens: a sudden storm, eclipse of the sun, heatwave or flood, could be ascribed to the irrational behaviour of the gods. Often, of course, man had a hand in his destiny, was unwittingly its cause. Old men told stories of the Flood, when there had been such wickedness on earth, when men had behaved so vilely to each other, had shown such little respect for the gods, that Jupiter, King of the Gods, had let loose the South Wind, with thunderclouds upon his brow, to bring down rain. He had struck, men said, with his fist; there had been thunder, the heavens had opened. Water had poured down, torrents of it, beating men's crops into the earth. Iris, Juno's messenger, dressed in the colours of the rainbow, had brought jugs of water to the clouds, to feed them: the rain never stopped. Then Neptune, Jupiter's brother, god of the Sea, took a hand. There were

tidal waves and floods, and soon the earth was a mighty sea, a sea without a shore.

All this was history, made sacrosanct by the gods themselves. If a man were fool enough to question any part of it, express any doubt—even to himself—the gods would come down and punish him: his children would turn upon him, his wife would vanish; as when Jupiter, turning himself into a bull, ran off with the young and beautiful Europa on his back.

In about the year 600 B.C., there came what can only be called an explosion—an explosion in men's thinking. In the town of Miletus, in the ancient Greek state of Ionia, was born Thales, and to this man belongs the credit.

Thales was a member of one of the great families of Ionia, in an age where the differences between social classes—between soldiers, merchants, philosophers, slaves—were of greater account than the differences between races. There were, living proudly together in the little state, men of every language and complexion, from all corners of the ancient world, all of them proud to be members of such a community. Thales was a man of initiative, with sufficient wealth to be able to indulge it: he travelled to Egypt, to the interior of Asia Minor, to Chaldea; and there he absorbed ideas that the people of these countries had collected over the centuries.

He noted that their myths, tales of their gods and their doings, were different to his own—though often they differed only in the names of the gods. But scattered among these strangers' stories were grains of information, complementary information which Thales on his return began to assemble. His motive was not just pure research, a seeking for knowledge because it was there: it was a severely practical exercise, because Thales was a practical man. He was a merchant and an engineer, his livelihood depended on the safe arrival of ships bearing his goods from the ends of the earth. Slowly, he divested his mind of gods, so that he could look to the sky and treat stars—for the first time in history—as entirely natural objects, made of earth and fire. He was the first to predict that when the moon—no goddess, this, just a lump of earth—came between earth and sun, there would be an eclipse. We do not know whether in fact he predicted the eclipses of 610 and 585 B.C., but we know that he predicted their possibility.

He made charts of the heavens, proved to the wondering men of Miletus that these could be used for safe navigation across the sea. Indeed, men had used the stars in much this way for years, but treating them with suspicion, as unreliable gods and goddesses with

human attributes, likely as not to alter their positions or obscure each other, just to cause shipwreck. Now, in this dawn of scientific thought, all changed. The stars were there, but they were physical, material things, not helped or hindered by the gods; and they had practical uses.

For example, as Thales proved, the Little Bear in the heavens—and of course, as he pointed out, it was no bear, it hardly even looked like one—could be a better guide for sailors than the Great Bear, even though the Great one had been deemed to rule the heavens. He and those of his Ionian school developed processes of stellar navigation we use to-day. Then, having proved them accurate, Thales went on to establish a means of telling the distance of a ship at sea. In the past this had been a matter of guesswork, good eyesight. A ship, viewed as a tiny object on the horizon, would be farther in the distance than a similar one appearing larger: if half as big, it was twice as far—though even this was guesswork. Thales established that by measuring two angles to the ship from opposite ends of a measured distance on the shore, the range to the ship could be calculated exactly. In the same way, the height of a mountain could be calculated by measuring the horizontal distance to its base, and the vertical angle to its summit.

But Thales's discoveries were not confined to the sciences of geometry and navigation, though he is best remembered for his contributions to them. He set off such an explosion of scientific thinking, that everything from architecture to commerce was re-thought, done differently. It was in his native Ionia that men came to realize the squat columns of the Doric temple need not be thick and ugly; that columns, scientifically designed, could be slender, elegant and beautiful, and still hold up a single roof. It was in Ionia that men rediscovered coined money; that banking and bills of exchange began to be used. Many of these devices had been tried, one by one, and rejected, in more ancient times: now they were re-thought, given new uses, by this eager people, fired with the spirit of Thales.

Though the gods had been relegated to their proper place, the people of Ionia did not reject them. Gods were there, but man still had control over his destiny in this world; the gods need not be invoked, consulted, placated, at every crossroad; in his life. For years men had observed phenomena—"red sky at night—sailors' delight", is an axiom that goes back thousands of years—and had made use of them, one by one. Now, with the birth of scientific thought, these phenomena were assembled: men saw that one was often

closely bound up with a dozen more, that hypotheses could be constructed from them. If the hypotheses fitted the knowledge available and were plausible, they were valuable: they could be proved or disproved later. In the meantime, the coming of rains, warm weather, the duration of a journey, the height of the highest mountain, the distance to the horizon, the depth of the sea, the total interest on a loan—all these could be observed or calculated. Trade could be made a thousand times simpler, less laborious, more profitable, by the use of money. No longer was it necessary to swap a basket of olives for a pair of sandals: one could part with the olives in exchange for a silver coin, and buy whatever one wanted—*when one wanted it*.

Because he was a famous man, much of what Thales did has been obscured in the mists of time. Any new invention, any theory, that saw the light of day, was immediately ascribed to him, even after his death, and we have little means of finding out which particular discoveries were his own. We can be certain, though, that he established a climate of opinion, a desire for truth and a habit of hard, constructive thinking, which made what followed possible. He built a bridge between the ancient world of myth and the world of reason: man, cautious at first, terrified lest the bridge break and leave him stranded out of reach of his gods, crossed it.

As we have seen, Thales set scientific, rational thought in motion, and others, inspired by his example, clamoured to follow. Scientists like Anaxagoras and Empedocles went further than he did, developed his ideas of astronomy, expanded his meagre tally of geometrical theorems, blazed a trail to the two great discoveries of the fifth century B.C. These were an exact knowledge of the annual movement of the sun in the heavens, and the determination of musical intervals—the discovery that every note has an exact mathematical relationship with every other.

The fifth century was the century of Democritus, perhaps the greatest of the Greek scientists or physical “philosophers”. He, like Thales, was a rich man and a traveller, born in about the year 460 B.C., in Abdera, a Greek colony on the coast of Thrace. His thinking was more fundamental than that of Thales, with less immediate practical application: he established—or at least predicted, for few men of his age would believe him—that everything in the universe is composed of atoms, moving in a vacuum. This theory has been proved correct, even though the twentieth century has succeeded in subdividing the atom. (Democritus maintained it was indivisible, and the word, which he coined, means just that.)

He devoted his thinking to the study of these minute bodies ("they jostle each other in every direction" he noted) and explained the sensations of heat and cold, sweetness, bitterness—even colour—by the different shapes, weight and speed of atoms. Correctly, he established that the earth is formed of the heaviest ones, that the lightest form the atmosphere about us. He made researches into body and soul, discarding, as Thales had done, all the mythology of gods entering into and leaving the bodies of men; he studied theology for, like Thales, he did not deny the existence of god or a god; he analysed the relationship between perception and knowledge; and he tried to establish a code of ethics.

Democritus needed courage for his work, for, by and large, he was hated and distrusted during his lifetime. Many of his ideas were two thousand years and more ahead of their time. But some of them were taken up, developed, by others after him—men like Euclid and Archimedes—and Greek science flourished and grew.

Yet, sadly, it did not endure. There came a time when the forces which had made, over hundreds of years, every effort to reject the findings and conclusions of men like Democritus and Thales, were successful. Suddenly, there were no more like them, and their ideas were buried and forgotten.

Science slumbered through the Middle Ages, before being awakened at the Renaissance—but here it was taken up from the point at which it had been rejected. Somehow the findings, the methods, of the ancient Greek philosophers—scientists as we would call them now—had survived: mankind was able to use them and push on to the frontiers of knowledge in our present day. Many of the writings of men like Democritus were lost or destroyed, but those that survive show us how advanced was their thinking and how much in their debt we are. Indeed, if we study ultimate theories of life and the universe around us, we find that little has changed, fundamentally, since these first great strides in man's thinking were taken, over two thousand years ago. As a present-day student of Democritus has put it: "In the last analysis, the picture of the universe is the same for us as it was for Democritus: an inconceivable number of corpuscles disseminated in limitless space, and moving eternally."

Man's gods are there still—but Thales and Democritus, and the men who followed in their footsteps, removed them from man's world of science and calculation. Gently, but firmly, they put them back, out of harm's way, in the heavens.

# *The Teachings of Buddha*

## *The First Great Popular Religion*

IN THE year 563 B.C., the principal religion of India was Brahminism. Brahminism was a modified version of an older religion still—Vedism, whose “scriptures” are considered to have been the work of poets living between 2000 and 1000 B.C.—and came into being round about the year 1000 B.C. as the result of the increasing number and the growing influence of the Brahmins, or priests.

Vedism was a religion which provided for the worship of a very large number of gods, for, strictly speaking, every aspect of Indian life and every act performed by a man was considered to be religious, and had to be accompanied by a prayer of religious rite. Nevertheless, all the different gods were regarded each as one aspect of the one Supreme Being.

The gods of Vedism were chiefly personifications of natural objects and forces, and while Brahminism retained the concept of the one supreme God—the One All Brahma—worshipped in all his many forms, the great difference between the ancient religion and Brahminism was a striking one.

In Vedism the gods were worshipped, feared and conciliated by prayers and sacrifices; while in Brahminism they were considered to be *controlled* by the sacrifices offered or by hymns chanted by the Brahmins.

This was a very important distinction, and one that was chiefly responsible for the development of the religion, for, as will be seen, those who wielded the supreme power were no longer the gods, but the Brahmins who controlled the gods. On the proper performance of the Brahmins’ priestly duties everything, even the acts of the gods themselves, depended.

The principal teaching of the religion was that it was a Way of Life. The good man was the virtuous, upright, honest man, who achieved this state by the strict observance of religious rites and ceremonies. But the Brahmins also taught that these rites and ceremonies had to be performed according to stringent regulations, which were so intricate that only the priests could perform them

properly and therefore effectively. So the ordinary man had to engage the services of a priest if he was to attain the Way of Life. The priest was absolutely essential as the channel of communication between men and the gods, and from this it followed that the priests attained a power scarcely before or since acquired by the priesthood of any religion.

This priestly superiority over ordinary men was established even more firmly by the introduction of a caste system, in which the priests represented the highest caste.

The teaching of Brahminism was based on two classes of religious literature, one regarded as inspired, the other as uninspired. The inspired literature embraces the Mantras, or Vedic hymns, and the Brahmanas. The latter are prose or liturgical treatises intended primarily as manuals for the Brahmins, and they lay principal stress on ritual, not, as do the Vedas, on theology and ethics.

Attached to the Brahmanas are theosophic discourses called Aranyakas, and also Upanishads. The Upanishads are collections of philosophical *obiter dicta* uttered by many men living at different times, and they constitute for Brahminists (and for modern Hindus) the principal authority in philosophical matters. They conceive Brahma—the Supreme Entity—as (1) an absolute impersonal being, (2) as the ground of being, and (3) as the personal God, the one creator and ruler. On the whole, it is the first conception that predominates, the second following it at no great distance.

The uninspired writings include the code of Manu, which teaches Brahminic doctrine. This code, besides containing a system of theology and philosophy, gives minute directions for the regulation of the individual life from the cradle to the grave.

Others are the two great epics, the Mahabharata and the Ramayana, in which the outstanding doctrines of Brahminism are taught. Embedded in the Mahabharata—the Iliad of India, it has been called—is a poem in praise of Krishna, one of the chief Hindu gods, called the Bhagavad-Gita, the Holy Song, generally regarded as one of the most exquisite specimens of religious poetry.

Such then was the religious situation in India when, round about 563 B.C. a certain Maya, while on a journey from Kapilavastu, the capital of the Kshatriya caste of the Sakya clan, whose country lay along the southern edge of Nepal, gave birth to a son in the Limbini Gardens, just inside the borders of modern Nepal.

Maya was the wife of a wealthy native prince, of Aryan stock, a Rajah of the Sakya clan, named Suddhodana. The Kshatriya caste were the warriors who ranked next after the Brahmins.



The boy born in the Lumbini Gardens was called Siddhartha Gautama, the latter being the family name. No "Life" of Buddha was written until several hundred years after his death, and in consequence what actually happened to him at any given point of his life has become embedded in a mixture of history and legend. It is, however, possible to piece together a consistent outline which can be accepted as historical.

As one would expect, the boy was brought up in an atmosphere of ease which the wealth, position and caste of his father made inevitable. For his part, his father tried to keep all the unpleasantnesses that happen to men in their passage through life from his son.

As the boy grew up, however, it became clear that he was uncommonly intelligent. He was never satisfied for long with the delights of the eye and the flesh, but was continually seeking knowledge. On the other hand, he conformed to the requirements of his station in life and undertook the training which was normal to a youth of his social standing.

There are two versions of his marriage which are not easy to reconcile. The first is that he won his wife in a "contest of arms" when he was sixteen, and had by her a son, Rahula. The second says that he did not marry Yasodhara until he was twenty-eight, and that Rahula was born a year later.

Whichever of the two versions is the correct one, however, it has been established that he left his wife and his home when he was twenty-nine and during the remaining fifty-one years of his life returned home only once. The reason for this decision, known as The Great Renunciation, appears to have been the sudden crystallization of his thoughts and meditations on the lot of Man.

Protected though he had been from the world's unpleasantnesses, he had, nevertheless, not remained in ignorance of them. The story goes that one day when he was out driving he saw first an old man, then a sick man and then a dead man. He asked his charioteer, Channa, what these sights meant, and received the answer, "These things happen to all men."

Thinking this over, it occurred to the young man that there was but one cause of Man's suffering, his birth; and he was much troubled, and presently the desire formed in his mind to save mankind from birth into a world of suffering. The religion of the people, Brahminism, seemed to offer no solution, and he could not decide how he could best fulfil the wish which was daily becoming stronger and stronger.

However, not long afterwards, he was out again with Channa and this time saw a man with a shaven head in a torn yellow robe; and on asking Channa who he was, was told, "He is one of those who have dedicated themselves to a homeless life."

That night, while he was deep in meditation, surrounded by his pleasure-girls who sprawled around him in unseemly postures, he suddenly became revolted by the pleasurable life that enveloped him and knew at once what he must do.

Going to his wife's bedroom, he found her sleeping peacefully with his baby son cradled in her arms. Not waking them, he bade them a silent farewell and left the palace, taking Channa with him and his favourite stallion, Kanthaka.

At the edge of the forest he got down from Kanthaka, cut off his long black hair with his sword, and sent Channa back to the palace with it. Going on alone he presently met a beggar and changed his princely dress for the beggar's torn robe.

He now knew what the object of his search must be. The cause of suffering in this world is lust and selfish craving in all its forms. To attain to rebirth on the Wheel of Righteousness lust and craving must be extinguished; only thus can Man reach the end of suffering. But how were lust and craving to be cast out of a man's life?

To find the answer he first visited Alara Kalama, a famous Sage; but the Sage could not give him an answer that satisfied him. So he went to another, Uddaka, and received no help from him either.

Wandering through the country of Magadha, he came to the town of Uruvela, and there settled down in a grove of trees to find Enlightenment. For six years he meditated, practising such an austere way of life that he almost wasted away. But in the process he overcame fear, subdued all the lusts of the flesh and gained complete control over his mind. Yet he had not received Enlightenment.

Perplexed, he suddenly realized that Enlightenment would not come to him through the ascetic life he was leading and he decided to eat again. Sugata, a maiden, offered him a bowl of curds which he accepted and ate, and afterwards he bathed.

After he had bathed, he sat down on a heap of grass at the foot of a tree determined to find Enlightenment. It was the night of the May Full Moon.

As he sat there, Mara, the Evil One, and his host of companions approached him and demanded the throne of grass which he had made for himself. But Gautama, undefeated by all the assaults of Mara, refused to give up his throne, and when the Evil One had departed, he fell into deep meditation.

And while he meditated, Enlightenment came to him; he saw for the first time the evil, the cause of all suffering, and the means by which it could be overcome. From that moment he became Buddha, the Enlightened One.

At first he decided that he would be a Buddha only to himself, enjoying alone the blessedness that came to him after he had reached the goal of all his aspirations. But the god Brahma visited him and put into his mind the decision to become a Buddha to all others, preaching the deliverance which had come to his own soul.

Now, while he had meditated and fasted in the grove, five other ascetics had kept him company. They had left him in disgust when he had decided to give up the austere life. To these five, he decided, he would preach first the Dharma, the Path which leads to the end of suffering.

He found his former companions in the Deer Park of Sarnath, near Benares, and on the night of the July Full Moon he preached his first sermon to them—the First Sermon of Setting in Motion the Wheel of Righteousness. The five men perceived the Truth of the Dharma, and were ordained by Buddha, who sent them out to preach the Dharma.

For the next forty-five years Buddha and his disciples wandered about India preaching, and the converts to Dharma increased rapidly in numbers. The Teaching appealed chiefly to the intellectual and wealthy classes, who, as may be imagined from the brief description of Brahminism which introduced this account of Buddha's teaching, found in it a far more satisfactory path to the good life than could be found in their former religion.

The monastic Order established by Buddha in the monastery built in the Jetavana Grove, which became the headquarters of his ministry, also grew at a great pace. Called the Samgha, admission to it was carefully safeguarded and the conditions of membership were very strict. The members were called Bikkhus, or beggars, since they had to beg for a living. Each one had to carry with him a bowl, and was required to dress in a yellow robe and to shave his head. Later, an Order of nuns was established.

On the one occasion on which Buddha returned to his father's palace, his son, coming to him, asked for his inheritance. The Buddha, turning to his chief disciple, Sariputta, said, "Receive him into the order". So the future king of the Sakya became a monk.

When he was eighty, while on a visit to Pava, Buddha was invited by the local blacksmith, Cunda, to a meal. After the meal he became ill, and having reached the Sala Grove of the Mallas, he

had a bed spread for him and lay down. There, surrounded by his disciples, he died.

Seven days later his body was cremated. The ashes were divided into ten parts and given to the Rajas in whose lands he had lived and died.

In the First Sermon of Setting in Motion the Wheel of Righteousness, preached to the five in Benares, Buddha declared the Four Noble Truths, which contain the kernel of Buddhist teaching:

1. Suffering is universal, no man being free of it from birth to death.
2. The cause of suffering is desire or longing, which leads to rebirth and the continuance of desire and misery.
3. Deliverance from suffering is to be obtained through the suppression of desire, the absence of passion of every kind.
4. This result can only be obtained by pursuing the holy eightfold Path of right belief, right aspiration, right speech, right conduct, right means of living, right aim and effort, right memory, right meditation.

The goal which Buddhism sets before a man as the Highest Good is called Nirvana. Nirvana signifies the spiritual state attained by one who has conquered self, and, by the exercise of self-sacrifice, sympathy, loving thought and deeds of kindness, extinguished desire. The attainment of Nirvana, which is achieved in two stages, implies the extinction of personality and the union of the individual with the infinite. The first stage may be attained in this world; the second, and more perfect, state only after death.

Buddhism was a rejection of Brahminism. It laid the greatest stress upon the correctness of life; that is, on the moral principles of living rather than on the observance of rites, which constituted the essence of Brahminism.

Buddhism ignored the existence of gods, and had no place for sacrifice, prayer, worship or the priesthood which the gods demanded. It taught rebirth—the transmigration of souls—the belief that when a man dies his soul returns to earth in another body.

The moral standards it required from its followers were extremely high. No living thing was to be killed; no-one was to take what had not been given to him; adultery was strictly forbidden; all lying was forbidden; no intoxicating drinks were to be taken; no one was to be the owner of silver or gold; these were the main points.

The spread of Buddhism was extraordinary, for it proclaimed a Way of Life which, unlike the teaching of other religions, could

be readily understood by men as being able to provide them with a means of attaining a measure of perfection in their own living. All other religions up to this time had taught that perfection could only be reached by Man's complete subservience to the gods.

Within a relatively short time Buddhism had swept all over Asia, from India and Ceylon, through Burma, Tibet, China and Japan. It brought to the great land-mass of Asia a new conception of a way of life that gave to men a new incentive to conduct their lives on a high moral level. Its influence in the East cannot be assessed.

To-day, nearly two thousand five hundred years later, it is still a tremendous force in the world, its followers numbering more than one hundred million.

## *Lao-tze Founds Taoism*

### *A Major Spiritual Influence in Asia*

IT IS difficult to apprehend without a special effort that China was enjoying its Golden Age when Noah was building his Ark to escape the threatened destruction of the world by flood. But it is a fact that ancient Chinese records contain accounts of a great flood round about the year 2349 B.C.—the date Old Testament scholars ascribe to Noah's flood—that necessitated extensive engineering works in China, which were completed by the Great Yu, the co-ruler of the emperor-sage Shun, and founder of the Hsia Dynasty, twelve hundred odd years before the siege of Troy and sixteen hundred years before the founding of Rome.

Nothing definite is known about the origin of the Chinese. In the oldest authentic records they already appear as a more or less civilized agricultural people, settled in the valley of the Yellow River and surrounded by savage tribes. The early Chinese emperors of whom we hear were doubtless legendary, but the name of each is associated with some new discovery or invention, so that they may be regarded as symbolic figures indicating successive stages in the growth of Chinese civilization. Thus Sui-jen is the Chinese Prometheus, the Fire-producer; Fu-hsiis, the Animal-subduer, who taught his people to train animals for domestic purposes; Shen-nung is the Divine Husbandman, who taught the art of cultivation and the use of herbs as medicines.

Though their physical characteristics tend to make them a race of short men of small muscular development, their mental qualities are of a high order. In practical ability and shrewd common sense they have few equals among the Asiatic peoples, and as skilled artisans and traders they are probably without rival in the world. But while their faculty of memory is highly developed they cannot be termed strong in logic and abstract reasoning. To make up for the latter they appear to possess an intuition which cannot be described in concrete terms, but which leads them to an awareness of philosophical truths. By this "intuitive awareness" they have developed three great philosophies—Confucianism, Taoism and Foisin (or

Chinese Buddhism) which have had a tremendous impact upon the whole of the Orient from the days of their inception more than two thousand five hundred years ago until the present time.

Of these three philosophies Confucianism is by far the most prevalent and popular. Before the advent of Communism in China, it was the only religion recognized by the Chinese State; the others were merely tolerated.

Its founder K'ung Fu-tse—Jesuit missionaries later gave him the name Confucius—was born in 551 B.C. of good family. He married at the age of nineteen and is known to have had one son and one daughter. Early in life he was appointed to important positions of state. In 527 B.C. his mother died, and following the Chinese custom, he retired from public life until the years of mourning were over.

He spent this time in arduous study and deep meditation, and from 530 B.C. until 501, he devoted himself to teaching, gathering about him a band of disciples and giving much time to collecting, editing and publishing the ancient writings of his country. In 501 he was appointed governor of his native state of Lu, and later chief criminal judge; but disgusted with the way in which his country was governed, he resigned and spent more than a dozen years wandering about the land. In 484 B.C., on the invitation of the ruler, he returned to his native province and remained there until his death in 479 B.C. During this time he produced his only original work, *The Book of Spring and Autumn*.

Correct in outward moral behaviour and punctilious about religious observances, however little he believed in their implications, he was, nevertheless, a man lacking in sympathy, love and the other gentler graces of character, which counted little in his ethics. Despite this, he succeeded in inspiring in his disciples confidence, respect and even affection.

Now, shortly after he had begun his teaching, Confucius, according to tradition, paid a visit to the historian of the archives of Chou, by name Lao-tze, and according to the *Records of the Historian* (the earliest general history of China, written at the beginning of the first century B.C.) he asked Lao-tze "to instruct him in the rites".

That Confucius the philosopher should seek this interview must be accepted as a firm indication that by this time Lao-tze had achieved a considerable reputation also as a philosopher and teacher. The meeting was not altogether a felicitous one, for, by the same source we are told: "Lao-tze said, 'What you speak of concerns merely the words left by people who have rotted along with their bones. Furthermore, when a gentleman is in sympathy with the

times he rides abroad in a carriage, but when the times are against him, he drifts with the wind. . . . Rid yourself of your arrogance and your lustfulness, your ingratiating manners and your excessive ambition. These are all detrimental to your person. This is all I have to say to you.'

"On leaving, Confucius told his disciples, 'I know a bird can fly, a fish can swim, and an animal can run. For that which runs a net can be made, for that which swims a line can be made, for that which flies a corded arrow can be made. But the dragon's ascent to heaven on the wind and the clouds is something beyond my knowledge. To-day I have seen Lao-tze who is perhaps like a dragon.'

In contrast with the details we have of Confucius's life, apart from this meeting with him, very little is known about Lao-tze's life. Indeed, only one other fact is recorded: that at a very advanced age—some say he lived to be over a hundred and sixty—when he saw Chou going into a decline, he left the city and disappeared for ever through the north gate of the province. But at the request of the Keeper of the Gate, before he passed through he wrote "two books setting out the meaning of the Way of Virtue, in some five thousand characters", and these he bequeathed to the world.

There are some scholars and historians who do not believe that Lao-tze was an historical character. It is their contention that Taoism, the philosophy supposedly developed by Lao-tze, has somehow sprung from ideas formulated by a number of unidentified "schools of thought" which mushroomed at the time of Confucius, the Golden Age of Chinese philosophy. In support of this theory, they educe the "sacred" books of Taoism known as the *Tao-Te-King*, the Canon of Reason and Virtue (sometimes called simply the *Lao-tze*), pointing out the tenuousness of the links binding a large number of the thoughts expressed in it and maintaining from this that the work in its present form was compiled by a series of editors; that it is in fact an anthology.

Nevertheless, Taoism had begun to exert a wide general influence on men's thought by the time that Confucius began to teach. The scholars just mentioned explain the tradition of the meeting of Confucius with Lao-tze as a parable drawing attention to the fact that the Confucian doctrines are opposed to many of the Taoist doctrines.

Put briefly, Confucius taught that ethics are based on altruism. His golden rule was, "Do not to others what you do not wish them to do to you". He laid great stress on the duty of every man to



cultivate his best qualities and suppress the bad. Knowledge he held to be the key to virtue. If men know what is wrong and the evil it causes, they will avoid it. The means by which virtue is to be cultivated are the study of poetry, the study of music, and the study of ceremonial, or manners.

In his political doctrines he held that the State is supreme. There is, he taught, at the heart of things a fixed order which must be found in the words of the wise men of old, as treasured in the Nine Classics, the books of wisdom.

Lao-tze, on the other hand, taught that the universe is based upon a formative principle: *Tao*, the Way, from which all reality, *Te*, is derived. This metaphysical concept of a First Cause, lacking personality or consciousness, was not an original idea of Lao-tze's, but was of ancient origin in China. Up to this time, however, it had only been expressed in vague terms, and the *Tao-Te-King* gave it a coherence which had been lacking before.

On the other hand, it is not at all easy, especially for the Western mind, with its emphasis in all its considerations of philosophy based on logic, to apprehend this laconic main concept of Taoism. The fact that it rivalled Confucianism in the land of its birth underscores the reference made earlier to the Chinese weakness in logic and abstract reasoning which is more than compensated for by intuitive awareness, which permits the Chinese mind to reconcile seemingly contradictory thoughts.

This characteristic is present in the very opening stanzas of the *Lao-tze*:

The Way that can be told  
Is not the constant Way;  
The name that can be named  
Is not the constant name.  
The nameless was the beginning of heaven and earth;  
The named was the mother of the myriad creatures.

These two are the same  
But diverge in name as they issue forth.  
Being the same they are called mysteries,  
Mystery upon mystery—  
The gateway of the manifold secrets.

The first great principle of Taoism is the relativity of all attributes. Nothing is in itself either long or short; it is only longer or shorter than something else. All opposites, even life and death, thus merge. Not to be in rebellion against the fundamental laws of the universe

in which *Tao*, the Way, is embodied, is the first step in Taoist discipline.

The abstract expression of the *Tao* is developed from this concrete expression. In the abstract *Tao* represents the universal cosmic energy which supports the visible order, or nature. When it is impersonal, this cosmic energy may be termed as *being*, and is to be found always everywhere. When it has qualities of spontaneity and operates all the time in a regular manner aiming to achieve the greatest good for all beings, it may be termed as *becoming*. The *yin* and the *yang*, the male and the female, the positive and negative, principles, spring from the *Tao*. It was the interaction of the *yin* and the *yang* which created the heaven and the earth, which, in turn, produced all beings, thus indicating that the human order springs from what may be termed eternal energy.

In its political aspects Taoism represents the very converse of Confucianism. It rejects, for example, all forms of centralized government and encourages the highest degree of democratic self-government. Militarism is also unequivocally condemned, while the impassive acceptance of all experience is given the highest measure of approbation.

Advocating frugality and simplicity, and, in its rejection of the Confucian view of education, putting forward instead the ideal of preserving the innocence of mankind rather than keeping it in ignorance, it is in the metaphysical aspect that Taoism can be accepted as a mystic religion. How deeply this tenet impressed itself on its Chinese adherents can be judged by the latter's genuine contentment in situations which, by any standards, are the least comfortable; and also by their esteeming culture above all other things: "If I have two pennies I spend one on bread and the other on a flower that I may contemplate its beauty."

However, Taoism and Confucianism clashed most strongly in their ethical conceptions. Whereas the heart of Confucian ethics is represented by justice, love, the reverence of wisdom and sincerity, these very virtues are considered by Taoism as the primary disruptive influences in the simple life in the Way, since they produce distracting contraries which blemish the purity of life.

The first followers of the Way were practical mystics who hoped to bring about the ideal of social order by the closest possible adherence to the *Tao*. They were concerned with "this world", and they sought to achieve their aim in three stages. The first was purgation, the ridding of the individual of selfishness and self-seeking; the second was the shedding by the individual of his individuality

through the distraction of the contraries, by which union with the *Tao* was achieved; and the third was the acquisition of power which permitted the individual to merge with the Way and thus escape the limitations of time and space.

The early mystics practised breathing and went without food for long periods. By these means they hoped to achieve a long life here and a future life in the Taoist paradise.

With the passage of time other Taoist philosophers have had a considerable influence on the reformulation of the doctrines. The most prominent and brilliant of these later thinkers was Chuang-tze, who, in the fourth century B.C., brought Taoism into line with orthodoxy by regarding the Tien, Heaven, as the First Cause, and *Tao* as the Divine Manifestation.

Long before the advent of our era there had been grafted on to the old speculative Taoism a mass of superstition, which was derived partly from primitive shamanism—a form of spirit worship in which the *shaman* denotes the medicine-man whose soothsaying and exorcizing are aided by ancestral ghosts—and partly from the alchemy, with its search for the elixir and the philosopher's stone, which had reached China from the Greek garrisons of the Hindu Kush.

Of this later Taoism, Chang Tao-lin, a sorcerer of the first century A.D., is regarded as the first exponent. Indeed, he is looked upon as the founder of Taoism as a religion, as opposed to a philosophy. From Chang are reputed to have descended the line of so-called Taoist Popes, numbering sixty-two in all.

At about the same time Buddhism began to pervade China. In A.D. 61 the Emperor Ming-ti, as the result of a dream, sent messengers to India for Buddhist teachers and books. Two monks returned laden with images and scriptures of the Mahayana School of Buddhism. But the teachings of the Enlightened One were not well received. The almost complementary Confucian and Taoist ideals filled the minds of the cultured levels of society, and both, being indigenous, combined to cold-shoulder the alien ideas exposed by the two monks. Three centuries were to pass before Buddhism joined Taoism and Confucianism to form the famous tripod of Chinese religion.

Up to this time Indian Buddhism was still merely a study for the intelligentsia, for its writings had not yet been translated into the vulgar tongue. This latter work was undertaken by an Indian Buddhist, Bodhidharma, whose brilliant mind made short shrift of the prevailing speculative thought and salvation by faith. It would appear that, without having any intention of doing so, Bodhidharma

founded a School which within a few hundred years rivalled Foism, and which by the end of the Ming Dynasty (A.D. 1644) was paramount.

Since one of the most remarkable features of Buddhism wherever it is found and of whatever School has been its ability to assimilate existing religions in any country into which it has been introduced, Bodhidharma's School, known as Ch'an, was greatly influenced by Confucianism and particularly by Taoism. Since Ch'an was developed into the Zen Buddhism of Japan, Taoism may be held to have influenced one of the most virile Schools of Buddhism ever to exist.

At the time of its greatest influence Taoism supplied not only a way of individual life, but also an art of ruling. That the king is not himself an administrator but should rule through the wise men whom his virtues attract to his court, was a view held by Taoists and Confucians alike—it was in fact their point of greatest contact—but the Taoists carried the idea much further and laid great stress on *wu-wei*, "inactivity", as the hall-mark of the truly enlightened ruler. *Wu-wei* is a kind of transcendental *laissez-faire* based on the idea that in human affairs as well as in nature, there is an automatic order which works so long as it is not interfered with.

The influence which Taoism exerted on Asia, and particularly on China, has been rivalled only by that exerted by Buddhism. In fact, it would be possible to argue that because of the contribution it made to Buddhism its influence has been the greater. This influence has remained right down to modern times, at least up to the arrival of Communism in China.

Its great appeal to ordinary people was that its primitive animism, with its promise of an after-life, could be easily apprehended; and as this assurance of survival was what most men found they needed in order to overcome the fear arising out of ignorance of what really happens after death, its teaching was most acceptable. By pointing out the way by which men might reasonably expect to survive after death, Taoism provided the comfort for which men's souls yearned. Such comfort in the earthly existence was bound to have a profound effect on their development as human beings, and consequently upon their history. Herein lies the true significance of Taoism.

## *The Battles of Salamis and Plataea*

### *The Greeks Defeat the Persian Empire and Determine the Course of European Civilization*

OVER THE swaying, rolling roadway they marched, thousand upon thousand of them. Soon the second roadway would be in position and still more would be swarming over that; there would be parallel streams of small, brown-skinned men, lightly armed (which was well, for the journey to their battlefield was long), thousands of Persian soldiers flooding over this bridgehead into Europe, a bridge they had built themselves. It crossed the Hellespont at its narrowest point, a mile in width; it had been made by the King's engineers in an incredibly short space of time, by locking three hundred ships together with rope, laying a wooden roadway across their decks. The second bridge, nearly finished, would embody another three hundred and sixty of Xerxes's ships.

But these ships were but a small part of Xerxes's navy. He had assembled, in addition to the vast army now crossing into Europe, three thousand naval transports and a thousand warships, and these, while the army marched northward, westward, southward towards the lands of the Athenians and Spartans, would sail across the Aegean in a massive combined operation, a punitive expedition which would destroy for ever the ability of these tiresome Greeks, these irritating little independent states, to interfere with the slow, beneficent spread of the Persian Empire. Xerxes was new to his throne, but he had every intention of carrying on where Darius, his father, had left off—and indeed, it was vital that he do so; be seen to do so: new kings—and Xerxes was no exception—are shaky on their thrones.

The last engagement between Greeks and Persians had been ten years back, in 490 B.C., at Marathon, when Darius was still alive, and it had ended in shameful defeat for the Persians. The little Greek states, small, independent, though they were, had a remarkable ability, Darius had discovered, to coalesce in times of danger. Five years later, in 485, while he was preparing to avenge Marathon in a way that would leave no doubt in any mind, Greek or Persian,

he died. He had been hindered in his preparations by a revolt in Egypt, a revolt which had to be crushed, crushed like a snake before it could poison the rest of the Empire. It was still uncrushed when Darius died; his son Xerxes was left to inherit not only the initial unease of a new ruler, but a full-scale revolt in a part of his kingdom.

For all this, the Greeks heaved sighs of relief. It had soon become obvious that, though Marathon had seemed a splendid victory, it was the beginning, rather than the end, of a campaign. The Persian Empire was large—very large—with unlimited resources in manpower and wealth. Its soldiers were not so well trained as the Greeks, nor so heavily armed, but there were thousands more of them. There would always be thousands more of them.

And yet, if the Greeks could repulse this new invasion and inflict one more defeat on the enemy, they might succeed in turning his attention elsewhere.

This, as we shall see, they did. It is for this reason that the twin battles of Salamis and Plataea, in 480 and 479 B.C., are of greater importance in world history than any others. No battles in history have had more lasting effect than these two: we can, with some accuracy, say that the whole of Western civilization stems from them. Had the Persians won, not the Greeks, the world would have become a Persian empire, with an Asian civilization. Greek civilization would have been snuffed out.

By 484, the revolt in Egypt had been dealt with and the young Xerxes began to prepare in earnest for his drive into Greece. His Empire was divided into twenty "satrapies", and now each of these was called on to provide a large contingent. As Herodotus put it: "There was no nation in all Asia which Xerxes did not bring against Greece." He gives a figure of two and a half million combatants raised in this way, and though the number is probably exaggerated, there were far too many to be transported by sea: hence the bridges over the Hellespont.

News of Persian plans and Persian moves travelled ahead of Xerxes: the various Greek city-states had already called together a Pan-Hellenic Congress to consider the problem of this all-out invasion of their homelands. Xerxes had sent messengers to all States except Athens and Sparta—the ones he was determined to crush—messengers who demanded earth and water, twin symbols of submission. From Athens and Sparta, even were those states willing to send them, they would not be acceptable: defeat, bloody, immediate and total, was Xerxes's plan for these two.

And although a few States sent tokens, the majority resolved to

fight at the side of Athens and Sparta. The question was: where in all Greece to make a stand against an army and a navy far bigger than one's own?

At first it was decided that the defence of the Isthmus of Corinth, the narrow channel that divides the large southern part of Greece, the Peloponnese, from the northern and central parts, would be the only answer. The states of the Peloponnese regarded it as the citadel of Greek independence, and its defence was vital. But when the plan was considered more carefully, the Greeks realized that if only the isthmus were held, all northern and central Greece would fall into the enemy's hands! Then, using it as a base, he could easily turn the isthmus defence from the sea, and the whole of the Peloponnese would fall into Persian hands. No, if a defence were to be put up, it must be well to the north. But as both the Greek Navy and the Greek Army (the contingents, aggregated, from the city-states) were inferior in numbers to those of the Persians, this could only be done in the narrow seas and the narrow passes.

All this was frantically considered, discussed, argued, amended, while Xerxes's troops were swarming over the Hellespont and his warships were sailing across the Aegean. Desperately, the Greeks appealed to the most powerful ruler in their world, Gelo of Syracuse, for his Navy. Syracuse was not yet threatened by the Persians, but it was a Greek city, and as such it would be threatened soon.

Gelo knew this. But—and this is where Persian strategy was so far-seeing, far-ranging—the Carthaginians had been urged, by Xerxes, to invade Sicily. Every man, every ship, of Gelo's was needed to repel the Carthaginian attack.

The Greeks decided to precipitate, if they could, a naval battle in the cramped and narrow Euboean Channel between their east coast and the large island of Euboea—a hundred miles long—and couple this naval tactic with the defence, on land, of the Pass of Thermopylae, the only place, it was believed, where an invading land force could get between impassable mountains and the sea. A picked band of men could hold the Pass indefinitely and to this end Leonidas, King of the Spartans, was despatched with a force. Once Xerxes's army was held up—so the Greeks reasoned—he would force his fleet southward through the Channel to outflank the defenders—and here, the Greeks felt, they stood a good chance of defeating him. Accordingly, they assembled as large a fleet as they were able, a fleet out of all proportion to the handful of men who were guarding the Pass of Thermopylae.

And this was a major blunder: Leonidas had far too few troops to

do the job allotted him. He held up the Persian Army with little difficulty: the lightly armoured Persians, however much they might outnumber the Greeks, were unable to beat back the heavily armoured soldiers in the narrow confines of the Pass. But Leonidas failed to consider what might happen if the Persians discovered a path over the mountains—and when he found that they had, that they were streaming over the hills, outflanking him, he had too few men to stop them. He refused to surrender, was killed with all his force, and the mass of the Persian Army poured through the Pass. Outflanked by land, the Greek Fleet sailed hurriedly south to the isthmus.

And now Themistocles of Athens, the man who had fought so long to give his city a powerful fleet, and had succeeded, saw with a sudden thrill of pride that nothing less than the saving of Greece depended on the Athenian Fleet. It was, in fact, most of the allied navy: many ships from the other contingents had been destroyed in a storm, and more in a preliminary skirmish with the Persians. Themistocles rushed his fleet towards the island of Salamis in the Saronic Gulf, to the west of Athens, last defence of the Isthmus of Corinth, and the Persian Fleet followed. Then the Persian Army reached Athens, laid siege to the Acropolis, slaughtered its defenders.

Themistocles decided to trick Xerxes into a naval battle in the narrowest part of the Gulf, between Salamis and the mainland, where the distance between the two was less than a mile and a half. He sent a messenger to the Persian king, informed him the Greeks “no longer agree among themselves, so that they will not now make any resistance”. The best way of destroying them, the messenger suggested, was to bottle them up in this narrow strip of water. They would surrender, of course: then the ships could be burnt, the men taken captive.

Xerxes fell into the trap. Had he refused to go near Salamis, had he instead sailed straight for the all-important Isthmus of Corinth, at the widest part of the Gulf, he would easily have defeated the Greeks, but now—falsely assured that they were on the point of surrender—he sailed close to the shore. The Greek captains had needed persuasion to stay there and wait for him, but now they did so, and with their heavier, more armoured—and far fewer—vessels they were able to butt into the tightly packed mass of Persian shipping, shearing off the oars on one side, making them impossible to navigate, wheeling round and ramming them amidships. On each Athenian ship was a boarding-party of fourteen armoured hoplites and four archers; what ships the triremes failed to sink by ramming or artillery, they boarded and destroyed.



Eventually, what was left of Xerxes's mighty fleet turned tail and fled.

The day—23 September, 480 B.C.—was a major victory for the Greeks, not so much for the number of Persian ships destroyed, but for the tremendous blow they had dealt to Persian pride, and particularly to the confidence of the new king. Up till now, his navy had been supreme in the Aegean: no doubt, if he wanted, he could make it supreme again, by rebuilding, but at the moment both the Persian Fleet and Persian morale lay at the bottom of that shallow sea.

Xerxes, still not secure on his throne, departed in haste to suppress rebellions nearer home, but left his general, Mardonius, in the Greek state of Thessaly with a large force. Mardonius now decided to persuade the Athenians to break loose from Sparta, to join his Persian force in an expedition against the Spartans, in exchange for a free pardon. This the Athenians refused to do and instead persuaded the Spartans to join them in an all-out attempt to get Mardonius and his Persian invaders off Greek soil. The Spartans, secure, since Salamis, in their Peloponnesian fastness, were slow to rally, but eventually they despatched a force to the mainland. Mardonius had now reached Athens: when he heard that the Spartans were coming, he set fire to the city and withdrew into the countryside where his Persian cavalry would have more room to manoeuvre. But so hasty was he, so anxious to inflict a defeat at the first opportunity, that he attacked the Spartans under their leader Pausanias, while they were still in the foothills, and here his cavalry, in broken, hilly country, was defeated.

Determined not to risk more of this, Mardonius moved his main force into the plain between Plataea and the river Asopus and here, according to Herodotus, the two armies faced each other for eight days and nights before battle was joined. Then the Persian Mardonius opened up with his archers. These soon placed the Spartans in an intolerable position, for they were unable to get close enough, against the barrage, to indulge in hand-to-hand fighting.

And at this point, Mardonius made his crucial blunder. His bowmen were wreaking havoc among the Greeks, but instead of leaving them, a flexible front line, to withdraw and advance as the battle dictated, he rushed up a mass of infantry behind them, ready to burst through. These, though, were jammed solid behind the archers, leaving them no room to manoeuvre. When the Greeks saw this, they made, under Pausanias the Spartan, one final, all-out effort, scattering the archers and their wicker shields like confetti.

hacking their way deep into the Persian line. This line, unable to withdraw, too close for archery, found itself in panic. According to Herodotus, the Persians "many times seized hold of the Greek spears and broke them, for in boldness and warlike spirit the Persians were not a whit inferior to the Greeks; but they were without bucklers, untrained, and far below the enemy in respect of skill of arms. Sometimes singly, sometimes in bodies of ten, now fewer and now more in number, they dashed forward upon the Spartan ranks and so perished."

And Herodotus concludes: "Thus did Pausanias . . . win a victory exceeding in glory all those of which our knowledge extends."

The date of this second Greek victory, the final and decisive Battle of Plataea, was 27 August, 479 B.C. From now on, Persia would retreat, soon to leave Europe altogether. The Greeks rushed to follow up their successes, rushed to capture or destroy the Persian bridges over the Hellespont and, after a whole winter's siege of the northern terminal, Sestus, they did so. What remained of the Persian Army in Europe made its painful way overland to the Bosphorus and there crossed back to Asia.

The decisive battles of Salamis and Plataea destroyed on one hand the prestige of the Persian Empire, leading to its eventual ruin; and built up, on the other, the prestige of the Greeks, starting that people on its amazing course of civilization. Poets sang songs about the two battles, linked them with the Trojan Wars; sculptors alluded to them in their sculptures. Greece was proud again: victorious, wise and strong.

With Plataea and Salamis the Western world came to the edge of the future—a future which Greece, Greek civilization would make great, which Greek intellect would conquer. For centuries to come—perhaps for ever—the mark of Greece would be seen, clear and lasting, on the civilization of the West.

## *The Hippocratic Method*

*A Greek Physician Proves, Centuries Before his Time, that it is the Patient who should be Treated, Not the Disease*

“THE FACTORS which enable us to distinguish between diseases are as follows: First we must consider the nature of man in general and of each individual, and the characteristics of each disease. Then, we must consider the patient, what food is given to him and who gives it—for this may make it easier for him to take or more difficult—the conditions of climate and locality both in general and in particular, the patient’s customs, mode of life, pursuits and age. Then we must consider his speech, his mannerisms, his silences, his thoughts, his habits of sleep or wakefulness and his dreams, their nature and time. Next, we must note whether he plucks his hair, scratches or weeps. We must observe his paroxysms, his stools, urine, sputum and vomit. We look for any change in the state of the malady; how often such changes occur, and their nature, and the particular change which induces death or a crisis. Observe, too, sweating, shivering, chill, cough, sneezing, hiccough, the kind of breathing, belching, wind, whether silent or noisy, haemorrhages and haemorrhoids. We must determine the significance of all these signs.”

These words, which might well have been written in the middle of the twentieth century, were in fact set out by the Greek physician Hippocrates in the fifth century B.C. They are words no doctor can afford to forget. Hippocrates knew that a disease cannot be treated as a thing by itself: the human being, the soul harbouring it, must be considered, in its entirety. The same disease, in two different bodies, might run two very different courses, the same disease need two very different treatments.

The order in which Hippocrates set out his examination is interesting. First, we “consider the nature of man in general”: then, and then only, do we consider his food, customs, mode of life. After that, and not before, we consider the more obviously “medical” attributes of the patient, his sputum, urine and so on.

We view the whole man. Not his disease.

This advice, though well over two thousand years old, has never been bettered. Much of what Hippocrates wrote—and he wrote and taught a great deal, in a long and crowded life—is a present-day guide, a bible, to a conscientious doctor. The whole ethic of medicine is based on his Oath; and some of his shorter “Aphorisms” sum up the whole of a doctor’s work, with its successes, its failures, its risks. “Life is short, science is long: opportunity is elusive, experiment is dangerous, judgment is difficult.” Probably no more embracing, penetrating remark has been made about the profession—in so few words.

But the words for which this remarkable man, who lived centuries before his time, will be most remembered are those of the Hippocratic Oath, the greatest of his moral texts. Some universities still require doctors, upon qualifying, to take this Oath, in one form or another, and although the words may differ, the content is much the same:

“I swear by Apollo the healer, by Asclepius, by Health and all the powers of healing, and call to witness all the gods and goddesses that I may keep this Oath and Promise, to the best of my ability and judgment.

“I will pay the same respect to my master in the Science as to my parents, and share my life with him and pay all my debts to him. I will regard his sons as my brothers and teach them the Science, if they desire to learn it, without fee or contract. I will hand on precepts, lectures and all other learning to my sons, to those of my master, and to those pupils duly apprenticed and sworn and to none other.

“I will use my power to help the sick to the best of my ability and judgment; I will abstain from harming or wronging any man by it.

“I will not give a fatal draught to anyone if I am asked, nor will I suggest any such thing. Neither will I give a woman means to procure an abortion.

“I will be chaste and religious in my life and in my practice.

“I will not cut, even for the stone, but I will leave such procedure to the practitioners of that craft.

“Whenever I go into a house, I will go to help the sick and never with the intention of doing harm or injury. I will not abuse my position to indulge in sexual contacts with the bodies of women or of men, whether they be freemen or slaves.

“Whatever I see or hear, professionally or privately, which ought not to be divulged, I will keep secret and tell no one.

“If, therefore, I observe the Oath and do not violate it, may I prosper both in my life and in my profession, earning good repute among all men for all time. If I transgress and forswear this Oath, may my lot be otherwise.”

Hippocrates was born in 460 B.C. on the island of Cos, a Greek island which had been colonized by Dorians, but whose civilization and dialect were Ionian. He was an exact contemporary of Democritus and Thucydides. In those days, as we can gather from the words of the Oath, medicine tended to be a family affair, and the family of Hippocrates, the Asclepiadae, all of whom practised it, were believed descendants of Asclepius (Aesculapius, to give him his more common, Latin, name), Homer's "Blameless Physician". Homer's legend has it that the sons of Asclepius became physicians in the Greek Army; and, in fact, it was only after Homer's death that Asclepius came to be held in reverence, as a god. The family of Hippocrates claimed descent from him, and their knowledge of medicine was handed down, in the terms of the Oath, from father to son, from master to pupil. It was a sacred trust, one that might not be abused. The seat of the Asclepiadae was the island of Cos, and here the young Hippocrates grew to manhood, gained a grounding in the science of medicine.

One of the more astonishing aspects of the various Hippocratic writings is that, though so many of them apply to our present age, they were composed in an age of almost total ignorance of the workings of the human body. Hippocrates knew less about the contents of the body and its mechanism than many a twentieth-century child (the veins, for example, carried air, and it was not until the time of the physician Galen, six hundred years later, that the movement of blood began to be accepted, albeit inaccurately), but despite this ignorance, his method, his approach to the subject, has never been bettered.

He travelled a great deal, in Greece and abroad, learning from his travels and in the course of them curing men and women from all corners of the ancient world. He would settle, for brief periods, in the regions he visited, healing the sick and studying the people and their customs, before moving on. From these years of travel and healing he sifted and compiled his teachings, and, in the course of them, achieved great and justified fame during his own lifetime. We believe he died in 375 B.C., at the age of eighty-five; yet there are legends that he lived to the age of one hundred and thirty. However long he lived, we do know that he devoted his life to the care of the human mechanism, body and mind, and to the passing on of his knowledge, his methods and his attitude to others. He wrote a great deal, though as with other famous men there are writings ascribed to him which we have reason to believe he never wrote. Through them all, one is struck with the vast appetite for

knowledge, for information. Not for him the snap decision, the hasty diagnosis based on a symptom: the whole man must be studied, and not only in the Present Tense. We must know what has gone previously; we must predict, to the best of "our abilities and judgment", what will happen: History, Diagnosis, Prognosis.

Like other physicians of the period, Hippocrates had a high rate of failure, which is hardly surprising in view of the confused state of medical knowledge at the time, a confusion which reigned for many hundreds of years. Even after Galen had established the movement of blood from the heart, it was not until the seventeenth century A.D. that William Harvey proved its circulation: in Greek times, blood was pumped to the extremities of the body and miraculously used up.

What was remarkable about Hippocrates was his method. The system of diagnosis set out at the beginning of this article can scarcely be improved on to-day: yet this was written at a time when men believed in magic, would rush to oracles, make sacrifices, gifts to gods and goddesses, to cure themselves; and when everyone, apart from a precocious few like Hippocrates, believed in this. While others were calling on Zeus and Apollo to help them, Hippocrates was teaching that "the examination of the body is a serious business, requiring good sight, good hearing, and sense of smell and touch and taste, and power of reasoning". All this is important, but the last three words, which were nonsense to many, are the most vital. At a time when every sort of healer—well-intentioned or charlatan—was making an exhibition of driving out bad gods, propitiating good ones, Hippocrates could write and teach that no methods of an ostentatious, boastful kind should be used: the physician must be quiet, calm and modest in his actions. It would be shameful, Hippocrates wrote, "if, after so much noise and exhibition and so many words, he in the end achieved nothing useful".

An important point in the teaching of Hippocrates is that the physician must give equally of his skill and comfort to all men. This included slaves. It established the tradition, still adhered to, that no doctor can be privately employed *to the exclusion of other healing*. Hippocrates, we learn, treated cooks, tavern-keepers, schoolmasters, stonemasons, miners, gardeners, vine-growers, cobblers, carpenters—to name a few—and many of these were slaves. "Particular care", he emphasized, "should be taken of the sick man who is a stranger and poor."

The ignorance of the body's working in Hippocrates' time was perpetuated by a custom which forbade dissection of corpses, and

this ignorance hung like a mist over all his work. Yet his teachings somehow transcended the way of life and thought of his age and survived to our day. Much of this teaching, with its inter-relation of body and mind, is only now, in the middle of the twentieth century, being fully understood. Despite the tremendous advances in medical science and technique during the last two hundred years—the discovery of the blood's circulation, of anaesthetics, antiseptics, antibiotics—more and more physicians are realizing that the human body is not just a machine. It may be kept going in a tent of oxygen, restored with penicillin, made mighty with hormones—but this is only half the story. We must study the whole man, see *why* he becomes ill. Nowadays we are learning that, far, far more often than was believed likely or even possible, the mind is the cause of illness. To take an everyday example: emotion or a sudden fright may make us lose our voices. If we have a sore throat and worry about it, we can lose our voices altogether, for weeks on end. If we can be made to forget we had a sore throat, our voices return, miraculously. Our minds and our bodies are one.

We are learning what Hippocrates taught, two and a half thousand years ago, that it is more important to prevent the patient's illness than to cure him. There are better things to do with life than recover.

## *The Thought of Plato and Aristotle*

### *Two Greek Philosophers between them Lay the Foundations of Moral Philosophy and the Science of Reasoning*

FOR MORE than forty years one of the most familiar sights of Athens was the figure of Socrates, the Philosopher. Professing to know nothing himself, though styled by the Delphic oracle as the wisest of men, he haunted the market-place, the streets and the gymnasia, conversing with any he might meet, and, under the pretext of seeking knowledge for himself, trying to make men think. It was this constant button-holing and his thick-set ugly appearance, with its snub nose and piercing eyes, which made him known to every Athenian; but among the intellectuals he was revered for his philosophy.

Born in 470 B.C., from childhood he had been subject to trances, during which he claimed to have received the warnings of a "spiritual voice". These warnings always contained prohibitions.

From his youth Socrates had been keenly interested in the religious, philosophical and scientific movements of his times. Physical science was then represented partly by the Ionian school of inquiry, which sought to discover how the universe came into being and what is the guiding spirit which moves it; and partly by certain of the Western schools, especially the Pythagoreans, who taught that the First Principle is to be found in Number—that is to say, Number determines the harmonies in music, the movements of the sun, moon and stars and the proportions of architecture, and so on; so that eventually Number is easily identifiable with everything that is orderly, proper, right, good and beautiful. Socrates seems to have been especially interested in the theories of Diogenes of Apollonia who held that air, in various degrees of condensation, formed the sub-stratum of the material world.

The result of his thinking about all these various theories was that he framed a theory of his own—the Theory of Forms. According to this theory, the world of sense is related to that of thought by the participation of things in the "forms", or patterns, which alone are permanent.



The theory may in the first place have been of Pythagorean origin, but Socrates developed it, both in its logical aspect and also as the key to morals. For example, just or courageous actions were viewed as becoming such by participation in the "forms" of justice and courage.

But Socrates owed more to the Pythagoreans. His mystical nature was attracted by the doctrine of the soul as a divine, immortal spark imprisoned in the body and released at death.

Socrates had risen rapidly to a position of note in intellectual Athenian society, and believing that he alone was conscious of his ignorance, he was convinced that he had a mission to convince others of the same truth about themselves. This mission he pursued until the close of his life, relentlessly and without ceasing, seeking opportunities of discussion, especially with the young, and exposing the inner contradiction of popular ideas, particularly in morals and politics. Aristophanes, in his famous comedy *The Clouds*, caricatured Socrates's "thinking shop" and suggested that Socrates was the head of a community something like the Pythagoreans. But from the writings of one of his pupils who was destined to achieve a greatness that excelled his master's, we are led to picture him as the centre of a circle of youths belonging to the best Athenian families, who are represented as regarding him with affectionate admiration.

Among the more orthodox Athenians, Socrates was bound to be unpopular for his ideas, especially those which revealed him as having a wider view of life than the conventional Athenian at this time, a view which looked beyond Athens and Greece, upon man as the brother of all men and a citizen of the world.

This was looked upon as a lack of patriotism, and it was not surprising, therefore, that sooner or later an attempt should be made to get rid of him.

When he was at length arraigned in 399 B.C., it was on charges of impiety and corrupting the youth of Athens that he faced his 501 judges. To them he explained his life and actions, but when judgment was taken he was found guilty by a majority of 60.

His prosecutor demanded the death sentence. Socrates put forward the proposal that he should be fined half a talent (about £240). The judges were bound by law to accept one or other of the two proposals, and they chose death.

Socrates might easily have escaped, but he refused to do so, and a month after the trial he drank the hemlock poison, cheerful among his weeping friends, with whom he had spent his last hours discussing the immortality of the soul.

"Death", he declared, "is either a state of nothingness or a change of the soul from this world to another. Wherefore, be of good cheer, and be assured that no harm can happen to a good man either in life or after death. The hour of departure has come; we go our ways, I to die, you to live. Which is better, God only knows."

In the group which had attended Socrates in his last hours and had listened to the last expressions of wisdom from the courageous man who was fired by the rightness of his convictions, was his pupil Plato. Plato had been horrified by Socrates's reception at his trial and by the final scenes in the death cell, in which he saw the intellectual blindness and cowardice of intellectually little men bent on destroying one of the great minds of the time.

In his account of the last hours which he has given in *The Symposium*, he has stated that the death of his master determined him to carry on the mission of his friend and mentor. It is implicit in the account that had he not embarked upon this undertaking he might not, in all probability would not, have developed his own philosophy which has had, and must continue to have, a permanent effect on world thought for all time.

At the death of Socrates Plato was twenty-eight. The event was such a shock to him that he felt that he must leave Athens, so he went to Megara, where he probably passed his time composing several of his now-famous Dialogues. A mathematician friend, Theodorus, then invited him to Cyrene, and from there he embarked on a tour of Egypt, Sicily and the Greek cities of Lower Italy.

In Sicily he fell foul of the tyrant Dionysius the Elder, because of the freedom of his speech, and it is thought that the story of his being sold into slavery on the orders of Dionysius has some basis in fact. Whether this happened or not, he returned to Athens about the year 386 B.C.

In Athens he began to teach partly in the gymnasium of the Academy and partly in his garden, situated on the Colonus. He taught without fees. From 386 B.C. until his death at the age of eighty-one in 347 B.C., except for two visits to Sicily, he taught without break in Athens.

Plato was born two years after the death of the great Athenian leader Pericles, and the world in which he grew up was one possessed by a desire to correct and restore the distracted social and political system of Greece. That system had culminated in the city-state of Athens, a democracy carried to its fullest conclusions, in which every citizen had a direct voice in the city's affairs.

Plato set himself to understand Greek society in all its extent and

depth, and it was this inquiry which brought him at the age of twenty into the circle of Socrates. In his later pursuit of this objective, it was his intention to point out, as his old master had done before him, the weaknesses of Greek society and to suggest remedies. In doing so, he struck out a system of philosophy of his own based on contemporary experience.

In the realm of logic and metaphysics, Plato took over certain results achieved by his predecessors, particularly by Socrates. Here his first task was to refute some of the logical heresies of some of the leading philosophers; for example, the destructive theory of Gorgias—Nothing is; if anything is, it cannot be known; if anything is, and can be known, it cannot be expressed in words. It was against this theory that Plato built up his Theory of Knowledge.

Put briefly, the Platonic Theory of Knowledge is based on three main assumptions. First, it is plausible to hold that the world of things is composed of individual objects; second, in the world of knowledge we are conscious of a collection of thoughts each different from all the rest; third, particulars in the external world, objects in space, appear to have an existence of their own, separate and independent of thoughts about them.

In his conclusions based on these assumptions, Plato puts forward the truer view; first, that the great number of objects in space, while each is separate and individual, possess each a character which is shared by other objects; second, that the simplest thoughts, although they occur as particulars, are also recognizable as more or less the same as other thoughts; and third, that things in space not merely correspond to thoughts in the mind, but that they are capable of being known.

*Particular* things and *particular* thoughts are what they are, because somehow they embody a *universal* nature or form. It was the main endeavour of Plato in this field to try to explain the relation of *universals* and *particulars*. His conclusions are summed up in his dictum: What is wholly real is wholly knowable; what is utterly non-existent is completely unknowable.

In the region of morals and politics, Plato was the first philosopher to offer a satisfying account of the principles that form and govern conduct and character. For him, morality is far from being intellectual in the sense of abstract. His "justice" is the virtue of the good citizen.

In *The Republic* Plato visualized the founding of a city which would meet all human needs. What he was suggesting was a Utopia, and as such his city has come in for much criticism, particularly in

modern times. But since it was to be this kind of city, the main requirement was for rulers able to carry on the work of the founder and the constitution and laws he prescribed. The ruler, the wielder of political power, must therefore be a philosopher.

It was in his description of his requirements for the Philosopher-Kings that Plato expounded his Idea of Goodness. "The Good", he says, "is what every man sets out to attain with a vague awareness of its existence. . . . It is the Idea of the Good which imparts truth to things known, and the power of knowing to the mind. From it come knowledge and truth, both of them lovely, but it transcends them both and is more lovely still. To it they owe their being, but the Good is beyond being and far surpasses it in nobility and power." In effect, this Idea of the Good corresponds to the Christian God, for Plato finds in it not merely the end of life, but the ground and cause of all existence.

The influence which Plato has had on all subsequent philosophies down to the present time can only be imperfectly estimated by considering the innumerable thinkers and poets of all ages who have drawn inspiration from him. He was succeeded by disciples who undertook to carry on his teaching, pre-eminent among whom was Aristotle, who must be regarded as his true successor and who developed Platonism on more scientific lines.

Aristotle was born in 384 B.C., two years after Plato began teaching in Athens. His father Nicomachus was physician to the grandfather of Alexander the Great, a fact which was to have a considerable influence on the great Greek conqueror, and through him on the world.

At the age of seventeen he went to Athens, and there became a pupil of Plato, at whose feet he sat for seventeen years. At the end of this time he embarked on a life of adventure in Mysia, a district of Asia Minor, until in 343 B.C. he was summoned to Macedonia by Philip to undertake the education of his son, Alexander, then fourteen. For seven years, with a few interruptions, the profoundest intellect of the age was occupied with the training of the supreme man of action.

When in 334, Alexander "passed into Asia to subdue the world", Aristotle returned to Athens, founded his Peripatetic School—so called because he walked about while he taught—and there lived, at the expense of his royal friend, for the next twelve years. When Alexander died in 323, remembering the fate which had overtaken Socrates, Aristotle retired to Euboeia, to spend the last months of his life in peace.

The basis of his philosophy is Plato's ideas of particulars and universals, but Plato's emphasis on the universals was modified by Aristotle through his strong scientific and biological leanings. In Aristotle the conviction that ideas have no existence apart from things, leads him to wage a war against the ideas of the Platonists relating to experience outside the senses. This engendered in him a passion for exact and comprehensive observation.

In every department of scientific inquiry he seeks to determine the facts, to register and classify the results, disposing of them in such a way that they reveal their true character, and form the materials out of which higher general ideas may emerge. This method he adopted in his approach to the whole field of knowledge.

Unfortunately, most of his works have been lost, but it is known that they included letters, speeches, poems, philosophical dialogues, treatises on national festivals, and manuals of natural history and rhetoric. Those works which have survived are not his highly finished literary efforts, but technical academic treatises, though they are, nevertheless, of the very greatest importance.

The greatest proportion of his writings that do exist are works on natural history and natural science. Many of them show traces of the limited nature of his early researches, but even so three of them—*The History of Animals*, *On the Parts of Animals* and *On the Generation of Animals*—draw from the leading modern scientists unqualified praise.

Of crucial importance is his Theory of Teleology, which he set out in a work *Concerning the Soul*. In it he asserts that not only human life, but animal and plant life also, are dominated by a soul dwelling in every creature, which prevents the material body from decaying and determines its growth towards completion.

This principle, appearing at its highest in Man as mind, is the form, and efficient cause and end, of the physical organism. By this principle Aristotle was able to explain organic life and growth as a development from the "possibility of existing" to "actual existence". It is a point of view which links Aristotle with general ideas about evolution.

He dealt with all the subjects to which he directed his attention in the same scientific way that he dealt with his investigations into natural science and history. He founded the *science of reasoning*, since called Logic. On six works collected under the title of *Organon* his fame rests as the inventor of Deductive Logic. It was as a rival to the *Organon* that Francis Bacon wrote his *Novum Organum*, which earned for him the title of inventor of Inductive Logic.

The influence which Aristotle had on all subsequent philosophers has equalled that exerted by Plato. His philosophy dominated the teaching of the universities of the Middle Ages, and still provides the starting point for many recent theories, for the powerful common sense which stamps all his reasoning, and the orderliness with which he worked, injected into the study of the ultimate problems a reality which "theory" lacks in its own primary nature. He was a philosophers' philosopher, and as such he could not fail to have an influence on all future thought.

# *The Conscience of King Asoka*

## *A New Standard in Rulership*

IN THE middle of the saffron, white, and green flag of the Indian Republic is something that looks like a wheel. And in fact it is a wheel—the Wheel of Asoka, placed there to commemorate and to honour a man who, more than two thousand years ago, was Emperor of India, and who, by common consent, is hailed as one of the greatest, perhaps the greatest, of all those who have ever sat upon a throne.

Asoka ruled over India from 273 to 232 B.C., and it was an India that comprised not only most of what we know as India proper, from the Himalayas to almost as far down in the peninsula as Madras, but also Afghanistan, Baluchistan, Kashmir and Nepal. It may even have extended across the mountains into Chinese Turkestan. In this immense area, with a population running into millions, there were tens of thousands of villages—then as now the foundation of the Indian social structure—and also numerous cities in which all the arts of civilization were carried to a height of perfection, cities filled with busy folk, brave knights and fair ladies, artists and craftsmen of superb skill and ingenuity, and deep thinkers in the mysterious realms of philosophy and religion. All this at a time when the inhabitants of Britain dressed in skins and painted their bodies with woad, and domestic architecture had not proceeded beyond the stage of shacks and shanties and holes in the ground.

Obviously this civilization had been in existence for a very long time—just how long is only now being properly appreciated. Until only the other day, as it were, it was generally held that the civilization of the Indian peninsula was much younger than that of Egypt or of Mesopotamia, and historians produced attractive pictures of Aryan tribesfolk, trekking across the Himalayan passes in their ox-wagons, and settling in the northern plains, sometime in the second millennium before Christ.

But no one would dream of starting with the Aryans to-day. Huge rubbish dumps in the Indus Valley—that were first explored about the middle of the last century, when a British engineer was

in search of hardcore to ballast the railway line he was constructing in the Punjab—have been dug into and turned over, and amazing things have come to light. Walls and streets of what must have been large cities, houses and baths, weapons and tools, jewellery and other works of art of high excellence, and evidences of writing and scholarship—year by year the discoveries go on, and it is now abundantly clear that when the Aryans did arrive in India they made their harsh impact on a civilization that was already very advanced and very old. The historians of India now have to allow for a period extending into several thousand years B.C., and the date is in constant process of being pushed ever further back into the mists of time.

Asoka, then, was the inheritor of an age-old culture, of a governmental system that was highly developed and immensely ancient. His claim to fame is that he gave what he found a new direction and imparted fresh ideas of a superlative virtue and excellence.

To begin with, he was very much as his predecessors had been. Like his father and grandfather and the rest of the members of the royal line, he feasted with his nobles, dallied in his harem, went hunting, watched displays of music and dancing, drank a lot and generally indulged in the joys of the flesh. So far as we can judge, he maintained the stern but just rule of his ancestors. Then in 261 B.C. he went to war for the first time, possibly being pushed into it by his advisers against his personal inclination. The enemy against whom he marched was a people known as the Kalingas, who inhabited a region in the Ganges plain. They were a powerful folk, and put up a stern resistance, but they were subdued at length. Then Asoka counted the cost. We know what it was, because he himself described it in an Edict which he had inscribed on a rock face, so that all who saw it should read it, and ponder.

"When His Sacred and Gracious Majesty had been consecrated eight years, Kalinga was conquered. From thence a hundred and fifty thousand people were carried away into captivity, a hundred thousand were slain, and many times that number died." Most conquerors, before his time and since, would not have given the matter another thought; after all, they would have argued, War is War, and woe to the conquered! But not so Asoka. Try as he might, he could not shut his eyes to the horrible scenes of massacre and red ruin he had witnessed, or his ears to the wailing of women and children mourning their dead and their own unhappy fate. And so the inscription does not end with the brief statement of accumulated horrors. It goes on: "No sooner had he annexed the Kalingas,



than His Sacred Majesty felt remorse for having conquered the Kalingas, because the conquest of a country hitherto unconquered involves the slaughter, death, and carrying away captive of the people. And that is a matter of the most profound regret and sorrow to his Sacred Majesty."

Never before had there been such a public confession of sorrow by a conqueror on the morrow of his triumph. But more was to come. The inscription continues: "If only a hundredth, or a thousandth, of the people who were slain, done to death, or made captive in Kalinga, were now to suffer the same fate, His Sacred Majesty would find it exceedingly grievous. Should anyone do him wrong in future, he will endeavour to forgive it as far as it can be forgiven. Even upon the forest folk [the most primitive and uncivilized of his subjects] His Sacred Majesty looks kindly, and seeks to make them think aright, for if he did otherwise, repentance would come to His Sacred Majesty. They are bidden to turn from their evil ways and so avoid punishment. For His Sacred Majesty desires that all living creatures shall have security, self-control, peace of mind, and happiness."

This is the confession that Asoka published to the world, and henceforth he was a changed man. Resolutely he put from him all ideas of military conquest and martial glory. He abandoned his ancestral religion with its bloody sacrifices, and embraced the peaceful faith of The Buddha. He gave up hunting, and boasted that he had reduced the daily allowance of meat in his household to two peacocks and a deer, and himself never ate meat again. He did not forbid the killing of animals for food, but he instituted close seasons when animals and fish might not be caught, and gave orders that nothing that was not edible should be killed. He did his best to limit if not to stop altogether the animal sacrifices that drenched the altars of the innumerable gods with innocent blood. In place of the chase, he went on pilgrimage to the principal Buddhist shrines, and caused to be erected there monuments to the founder of the Buddhist religion. Some of these have come down to us, notably the remains of the pillar that he erected at Sarnath, near Benares, to mark the spot where Buddha preached his first sermon, or (as the Buddhist expression has it) first "turned the Wheel of the Law". Among the pieces is the splendidly carved capital, composed of four lions placed back to back keeping guard over the "Wheel" of Buddha.

While he did not disband his army or give the Kalingas back their independence, he used his troops henceforth merely as police.

He built roads, and planted fruit trees along them to provide shade and refreshment. He dug wells at intervals, established rest-houses, set up hospitals for man and beast. He encouraged the cultivation of medicinal herbs, patronized architects and artists, and constructed vast irrigation works. While remaining a devout Buddhist, he tolerated other faiths.

Always he was at the disposal of his people, and he never spared himself in his efforts to serve them. One of his inscriptions gives a most interesting picture of him at work. "Whether I am at dinner or in the ladies' apartments, or in my private study, or in the royal mews, or in my carriage or walking in the palace gardens, wherever I may be, I have given orders that any matter of importance shall be reported to me without delay. I am never completely satisfied with my efforts and the way business is despatched. It is the welfare of all people that I must work for—and that means constant effort. Whatever exertions I may make are all for one end, that I may discharge my debt to all living creatures, and that while I may succeed in making some happy here, they may in the next world attain to heaven."

The great ruler's moral code is summed up in another of the "Rock Edicts", as one set of his inscriptions are called. "Thus said His Majesty," it runs; "Father and mother must be obeyed. Respect for all living creatures must be enforced. Truth must be spoken. The teacher should be held in reverence by his pupils, and a proper courtesy must be shown to all relations." Another of the Edicts declares that, "It is an excellent thing to hearken to father and mother; to be generous to friends and acquaintances, relations, priests and ascetics; to keep from killing living creatures. . . ." Another inscription, this time on a stone pillar, declares that, "The Law of Duty [what in Buddhist terms is *Dharma*] is an excellent thing. And what does it consist of? Many good deeds, compassion, generosity, truthfulness, and purity of life."

Not content with preaching righteousness to "my people", Asoka strove to extend the sphere of Buddhism in the world outside the region in north-eastern India in which it had had its rise. From what may be gathered from his inscriptions, it would seem that he sent missions to the Greek kingdoms in western Asia and to Egypt and the lands beyond. But of much greater importance was the one that he despatched to the island of Ceylon in about 251 B.C. It was headed by a prince named Mahinda, who was Asoka's son or perhaps a younger brother; and Mahinda's sister, the Princess Sanghamitra, accompanied him and seconded all his efforts. The missionaries were

welcomed by King Tissa, who embraced the Buddhist teaching and followed Asoka's example in establishing Buddhism as the national faith. Mahinda took with him a great deal more than a lofty ethical teaching, for it is claimed that he taught the people of Ceylon the arts of stone carving and of irrigation that had been so successfully practised in India. From that day to this, Buddhism has been the dominant religion in Ceylon, and the tomb of the gentle missionary-prince is a much-visited shrine not far from the ruins of the ancient sacred city of Anuradhapura.

Towards the end of his long reign, things seem to have started to go wrong with Asoka and his vast empire. According to some of the ancient traditions, he began to lose grip of affairs, and instead of attending to business of state devoted all his time to religious exercises, and wasted the resources of the country in indiscriminate charity dispensed to monks and monasteries. It is even alleged that he abdicated the throne and became a monk himself, not just for a time as is the way in present-day Burma, for instance, but for good. According to other accounts, however, which would seem to be better substantiated, he retained his position and all his regal dignities to the end of his life.

But it may be true enough, that his people were inclined to grumble at his discouragement of so many things that they had enjoyed in days gone by, and would like to enjoy again. A new generation had grown up that had not experienced the agony and the shock of the Kalinga campaign. His officers may well have got tired of the peace and have deplored his unwillingness to go to war with his neighbours even when a pretext might be found. He had also antagonized the priests and the whole Brahmin caste by the obvious partiality he showed for their Buddhist rivals and by his continued opposition to animal sacrifices. And of course, notwithstanding his essential greatness, he had his personal defects. He was inclined to be pompous; he was so absolutely convinced that he knew what was right for his people, far better than they could know it themselves—that his critics were always ignorant and misguided. It would have been surprising if, as he grew old, he had not shown some resentment of the opposition that was forthcoming to what he believed, with all his heart and mind and soul, to be the Way of Buddha.

Most of what we know about the great emperor is derived from the inscriptions that he had made, on rock faces, stone pillars, and on the walls of certain caves. A number of these have been preserved, and together they constitute what is surely the most remarkable set

of inscriptions in the world. We might perhaps be inclined to discount them somewhat but for the fact that they are so transparently honest. Here are no vainglorious inscriptions such as the monarchs of Assyria and Egypt set up on the scenes of their conquests. Here are no boastings of his treasures, his wealth and pomp and power. Not these things he ordered his sculptors to inscribe on the enduring stone, but a record of his compassion, his tender consideration, and, most remarkable, his remorse.

The turning-point in Asoka's career, wrote Vincent Smith in his *Oxford History of India*, was the Kalinga war, which "thus became one of the decisive events in the history of the world. The miseries of the campaign, the sufferings of the prisoners, and the wailings for the dead were soon forgotten by the vanquished, as they have been forgotten by other conquered nations after thousands of wars; but the effect which they produced upon the conscience of the victor is still traceable in the world of the twentieth century."

Asoka set a new standard in rulership; and although historians are still captivated by the Alexanders and Napoleons they cannot obliterate the memory of that great and good Indian emperor who was shamed, and said so, by the vulgar conquests of the sword. It is altogether appropriate and understandable, therefore, that the founders of the great peace-loving democracy of India should have incorporated in their insignia something that is a symbol not only of Asoka but of the Faith that he made the centre of his life.

## *The Battle of Zama*

*The Defeat of Carthage by Rome Puts an End to Possible Carthaginian Influence in Europe*

SOME TWO thousand five hundred years ago, Romulus and Remus founded a village on the banks of the river Tiber in Italy. As the years passed, the village, which had been given the name of Rome, developed into a great city, and its inhabitants into a great and powerful people.

Some five hundred years after the founding of their city the extent of the world of which the Romans had knowledge was limited to those countries bordering on the *Sea in the Middle of the Land*—the Mediterranean; Spain, parts of France, parts of Germany, Italy, Greece, Asia Minor, Palestine, Egypt and a broadish strip along the coast of North Africa. They believed that in the west land stopped at the Straits of Gibraltar. They knew nothing about the British Isles, nor about Norway, Sweden and Denmark. They had heard travellers' tales about countries lying to the east, but these went no further than Persia.

The Romans were not the only people living on the Italian peninsula when they built their village in 753 B.C. Several nations and tribes, with a considerable history already, had staked their claims to territory, put down roots and some had even developed advanced civilizations. Among the latter were the mysterious Etruscans, who were the most powerful of all the Italian nations.

As the Romans grew in numbers and strength, they gradually became masters of a great part of Italy. One after another they subdued the tribes and forced them to become their allies. These allies they continued to allow to govern themselves provided they would give an undertaking to supply men and weapons for the armies of Rome and never themselves to take up arms against their suzerains, at the same time following a foreign policy laid down by Rome.

Now, long before Rome was founded, the most powerful nation in the Mediterranean were the Greeks. The famous siege of Troy, though impossible to date exactly, is thought to have taken place

around 1200 B.C., that is, some 450 years before Romulus cut the first sod in the defence earthworks of his new village.

The Greeks were great travellers for they had mastered the arts of ship-building and seamanship, which the Romans were never to do with distinction. From the earliest period of their emergence as a prominent power, parties of Greeks had sailed about the Mediterranean and whenever they had come to a place which took their fancy they had decided to settle there. There were a number of Greek city-colonies in Spain, in what is now southern France—where one of the most important was at Marseilles, then called Masilia—in Corsica, Sardinia and scattered along the long coastline of North Africa.

There were also a number of Greek cities in southern Italy and Sicily, the chief of which was Tarentum, now known as Taranto and famous as a naval base. Tarentum's main industry was the manufacture of clothes made from the finest wool to be found in all Italy, and she carried on a large export trade in these products throughout the Mediterranean. To protect her merchant fleet carrying this trade, she had built a large and powerful navy.

As the Romans began to emerge as the dominant nation on the Italian peninsula, the people of Tarentum entered into an agreement with them, whereby the Romans, in return for favourable trading concessions, were pledged not to take their ships into Tarentine territorial waters. In the year 282 B.C., however, Thurii, another Greek city in southern Italy, found herself under attack from various Italian tribes and called to Rome for help. In responding to this call, the Romans broke their treaty with Tarentum and sailed their ships into Tarentine waters, whereupon, not unnaturally, Tarentum declared war on Rome.

Though it may have been a natural reaction, it was at the same time a somewhat foolhardy gesture, for there was not one competent general to be found in Tarentum at this time. No one realized this better than the Tarentines, and to make good the lack, they called to their aid one of the Greek generals, Pyrrhus. Pyrrhus landed in southern Italy, and proved more than a match for the warlike Romans. His victories all proved somewhat hollow, however, for each time he won a battle his casualties in men killed were far heavier than he could afford. Even he realized that this was not a situation which could be prolonged indefinitely, so he withdrew his armies elsewhere.

Though Pyrrhus had defeated the Romans, the latter had demonstrated that they were a very strong power indeed. The discreet

retirement of Pyrrhus was the first time for many centuries that any Greek army had felt discretion to be the better part of valour.

The action of the Tarantines provoked a not unjustifiable enmity in the Romans against all Greek colonies in Italy, and they attacked each in turn, defeated every one and made them into allies. By doing so, they secured the mastery of all central and southern Italy.

Rankled by his former pyrrhic victories, Pyrrhus returned to Italy in 275 B.C. in the hope of curbing Rome's expansionist ambitions, only to be soundly defeated.

By 260 B.C. Rome had extended her influence to large parts of northern Italy. Thus, in a little under five hundred years from the founding of the city, the Romans had become a great and powerful nation, so powerful that it looked as if nothing could stop them from becoming masters of the Mediterranean, if not of the then known world, for by this time Greece has passed the zenith of her imperial greatness.

There was, however, another great Mediterranean power that was determined to stop the march of Rome, if she possibly could.

A little less than fifty miles to the north of the modern Israeli port of Haifa is one of the most ancient of Palestinian cities—Tyre. For several centuries before the Christian era, Tyre was the capital city of a people known as the Phoenicians, a strange and interesting people who were the greatest sailors of the then known world.

They knew what the Romans and others did not—that the world did not stop in the west at the Straits of Gibraltar; for they had sailed through the straits out into the Atlantic, and by following the coastlines of Spain and France had reached the Scilly Isles and Cornwall, and with the men of those places had exchanged their famous purple cloth for tin. It is thought that some of them must have sailed up the Channel into the Baltic Sea, because they are known to have owned yellow and red amber, which is found only in the eastern Baltic.

Their most amazing deed was carried out in 610 B.C. when some of them sailed through the Mediterranean, out through the Straits of Gibraltar, all the way round Africa, and up the Red Sea to southern Egypt.

They lived only to trade. Unlike other nations at this time, they were not interested in the acquisition of territory, but only to sell the many articles they manufactured.

They were also the discoverers of mass-production, and as time went by and their production increased, they went farther and farther afield to find markets for their goods. To facilitate their

marketing arrangements, they set up trading-posts throughout the Mediterranean.

Originally a collection of store-houses and houses for the traders and their families, eventually all the trading-posts developed into cities, and in some cases these cities grew into powerful city-states. The most powerful of all these city-states was Carthage, on the North African coast immediately below the toe of Italy, which had been founded as a trading-post in 814 B.C., sixty-one years before Rome was founded.

The site for Carthage had been well chosen. It is practically midway along the north coast of Africa at a spot where only a narrow strip of sea separated it from Sicily. Through this narrow sea all ships passing from the east Mediterranean to the west and back again had to sail. Thus, the Carthaginians could control all Mediterranean shipping.

Then the hinterland of Carthage was a good rich land. If the post grew into a city, the citizens would be able to be self-supporting as regards food.

The development of Rome and Carthage coincided, but the Carthaginians were more enterprising at this time, for they established colonies all over the Mediterranean, and seized Sardinia and Corsica, and the western end of Sicily. To keep this empire under control money, men and ships were needed.

To raise the money they taxed their subject peoples, in exact contrast to Rome. This was only one of the many differences between the two. For example, while Romans themselves formed the greater part of Rome's armies, Carthage relied on troops supplied by her vassals and mercenaries from any other nation willing to supply them. Both the imposition of taxes and the pressing of unwilling men to fight their battles for them were eventually to prove the Carthaginians' undoing.

Quite early on both Rome and Carthage had recognized the threat which each constituted to the other, and in 509 B.C. had signed a treaty of friendship, believing this to be the most sensible way out of the difficulties which opposition might bring to both. Under this treaty, the Romans promised not to interfere with Carthaginian trading in the western Mediterranean in return for a Carthaginian promise not to set up any trading-posts in Italy.

Unfortunately, Rome was so taken up with gaining control of the Italian peninsula that she did not notice, until it was almost too late, how powerful Carthage was making herself in the western Mediterranean, and soon the friendship began to grow cold. The



actual break came when the Carthaginians began to establish themselves in the whole of Sicily. The outcome was the First Punic War (264-241 B.C.) which was mainly fought at sea, and ended in Roman victory, with Sicily, Sardinia and Corsica taken over by Rome.

In order to make up for these losses, the Carthaginians decided to seize large parts of Spain, and were so surprised with the success they achieved here that very soon they were secretly plotting to have their revenge on Rome. By this time Rome was beginning to turn her attention to Gaul, and were finding the Gauls very tough fighters. With her attention distracted thus, once more she did not notice what Carthage was planning.

The Carthaginian leader during the First Punic War had been Hamilcar, who, as a result of his defeat, had formed a great hatred for the Romans, a hatred which he passed on to his son Hannibal. When Hamilcar died in 228 B.C., Hannibal, though he was only twenty-six, was made commander-in-chief of the armies in Spain. From this moment he decided to make war on Rome as soon as possible.

This he did in 219 B.C. by attacking one of Rome's Spanish allies, Saguntum, which fell to him after a fierce struggle. Rome at once sent an ultimatum to Hannibal to surrender Saguntum, and when he refused, declared war on Carthage, which was exactly what Hannibal wanted.

Leading his armies out of Spain, he marched at lightning speed through southern Gaul towards Italy. A Roman army sent to intercept him was soundly beaten in the valley of the Rhone, and the Romans realized that they were confronting a really brilliant general. This view was underscored when Hannibal, whose Intelligence informed him that the Romans were blocking all the usual routes into Italy, led his armies, with elephants, over the Alps.

In Italy Hannibal subjected all the Roman forces sent against him to crushing defeat, and when he inflicted on them his greatest blow of all at Cannae, it seemed that nothing but a miracle could prevent him from becoming master of all Italy, including Rome. But already a miracle was on the way.

While they had been fighting Hannibal in Italy, the Romans had sent a young general called Scipio—he was only twenty-five, so younger than Hannibal—to Spain to attack the Carthaginians there. Here Scipio proved that he was as brilliant a commander as Hannibal. Within three years he had driven Carthage entirely out of Spain.

After Cannae, while Hannibal was waiting for reinforcements, Scipio made arrangements to return with his army to Italy, where

he arrived to meet a reception of wild enthusiasm. He realized that Rome would never be safe from Carthaginian attack until Hannibal was utterly defeated in battle, and Carthage was stripped of her power. But he believed that it was useless to confront Hannibal in Italy; he must get him on to a broad plain. So he proposed that to attract him to such a terrain he should take an army over to North Africa and attack Carthage, which must lure Hannibal back to its defence.

After some opposition from the older members of the Senate, the plan was eventually approved, and in the spring of 204 B.C. Scipio set sail for Africa with an army of 30,000 men.

There he quickly defeated the second-class armies which the Carthaginians had hoped would be sufficient to defend them. The frightened Carthaginian merchants at once demanded that peace should be made with Rome, but while ambassadors were being sent to Rome, Hannibal landed with his army.

At this moment, Scipio was having some trouble with some of the African allies of Carthage, but as soon as he received the news of Hannibal's landing he went to meet him. They met at a place called Zama, some five days' march from Carthage.

When Hannibal's scouts reported to him that Scipio's army was much stronger than he had believed and that the Romans were in fine heart, Hannibal came to the conclusion that peace might be advisable. So he asked Scipio to meet him to talk matters over.

The two greatest generals the world had so far known, met alone except for one servant each. They admired each other as soldiers, and eyed one another for a few moments before Hannibal at last spoke. When he had put his point of view, Scipio put his terms. These Hannibal was unable to accept and battle between them, they agreed, would supply the only solution.

On 19 October, 202 B.C., the two armies met on the plain of Zama. They were about equal in men, having roughly 40,000 each. But as well as his infantry and cavalry, Hannibal had eighty battle-elephants, the largest number he had ever used in battle before. These constituted the greatest threat to Scipio.

But there was also another very great difference between the two armies. Whereas Scipio's was composed of Romans and Italians, except for his Numidian ally Massinissa, Hannibal's was a very mixed lot, which included Greeks and Spaniards, Moors and Gauls, and the Bruttii, a tribe from southern Italy. These men had nothing to lose but their pay, and they did not consider their pay worth dying for.

Now, although the Romans had often met elephants in battle, no Roman general had ever devised tactics to overcome them. Scipio had, however. He changed the normal fighting order of his infantry, and ordered the ranks to open and let the elephants pass through when they led the charge, and then attack them from the rear. Also at the moment that the elephants began to lumber forward, Scipio ordered all his trumpeters and horn-blowers to make the loudest noise they could.

These tactics were completely successful. The elephants panicked and were an easy prey to the Romans. When the Carthaginians saw their elephants routed, most of the army turned and fled. Scipio gave pursuit, and when the battle was over Hannibal had lost 20,000 men killed and eleven elephants. The Roman casualties were a mere 1,500 killed.

The Romans inflicted such heavy terms upon Carthage that her power was completely destroyed for ever though she did subsequently attempt to make a comeback.

But the victory at Zama did much more than destroy Carthage. It left the Romans masters of the Mediterranean. Until now they had been content to be masters of Italy; now they began to turn their attention seriously to empire building, and for the next three hundred years they concentrated on building the greatest empire the world has known.

The Romans were great law-givers, great builders of roads and buildings, great farmers, writers, poets and teachers. Wherever they went they took these things with them, and when, between A.D. 300 and 400 their empire at last began to break up, every country of which they had once been masters had good roads, fine laws and many other benefits derived from Roman civilization.

Few other battles have so changed the course of world history as did Scipio's defeat of Hannibal at Zama.

## *Julius Caesar Gains Power in Rome*

*The Emergence of Rome as an Imperial Power Becomes Inevitable*

ONE OF the great pre-Second World War catch-phrases was the German term *Lebensraum*—living-space. It was an invention of Hitler to excuse the expansionist policy by which he hoped to create German Nazi world supremacy and the setting up of a German Reich destined to last a thousand years. He argued that the territory inhabited by his eighty million subjects was overcrowded and lacking in sufficient resources to provide a reasonable standard of living. As their paternalistic ruler it behoved him to supply what they lacked for true national happiness.

Basically, it was an ancient cry, and represented what historians refer to as Land-hunger. Certain nations, it would seem, have an innate compulsion which drives them to acquire more and more territory, regardless of the fact that that which they traditionally and nationally own is sufficient for their needs to survive. From the moment that they became firmly welded into one nation, the English began to display these tendencies. The great empires of Genghis Khan, of Assyria, of Persia and of Babylonia are all manifestations of the same compulsion. Hitler had a real though slight justification for needing more elbow-room for his teeming millions, but it was the desire to achieve world hegemony which really motivated him, as it motivated the ancient Romans.

As was pointed out in the article on the foundation of Rome, that event is shrouded in the deep mists of legend. So, too, are the early years of Rome's history; but the earliest factual glimpses that we do get of the Romans show them to have been a community whose existence depended on agriculture and war.

Early Rome must have been engaged in almost incessant warfare. The right bank of the Tiber was in the possession of the Etruscans, alien to all the other races of Italy, and the mountains in all directions were beset by turbulent raiders—the Volscians, the Aequians and others. The inhabitants of the plains of Latium—the Latins—were closely akin to the Romans. Rome was originally a member of a

confederation of Latin-speaking communities, of which she was a principal defensive outpost. Nothing but a very closely knit military and civil organization could have enabled Rome to exist in the earliest period.

The Roman polity rested on an idea of authority which, in many respects, was unlike anything found in any other ancient state. They had a word for it—*Imperium*; and the possessor of it in the early days, referred to historically as the King, exercised absolute sway over all affairs, military, civil and religious.

The changes from the Monarchy to the Republic took place when the nation revolted at last against the tyrant Tarquinius Superbus in 509 B.C. The revolt took very much the same course as the English "Glorious Revolution" of 1688. It took Superbus by surprise, he fled the city without a struggle, but presently returned with reinforcements only to meet eventual and humiliating defeat.

The Romans, determined to have no more kings, instituted a Republic, and although this inevitably meant changes, the quality of the *Imperium*—we have it on the authority of Cicero—in no way changed. The changes were of a practical nature. Instead of the *Imperium* being wielded by an hereditary despot, it was put into commission, and held jointly by two persons, two chief magistrates, first called *Praetors* (headmen) and later *Consuls* (colleagues), by which title they are more usually known.

The Consuls held office for one year only. They were elected by the whole body of Burgesses; that is to say, the whole body of warriors had a voice in the appointment, as was natural, since it was, first and foremost, a choice of commanders over the army.

This principle of having colleagues of equal privilege was extended to all offices subsequently created, with one notable exception. It seems to have been foreseen that this system of collegiality, as it is called, would give rise to certain difficulties, for allowance was made for either of the two Consuls to nominate a dictator, who held supreme authority for six months over citizens and ordinary magistrates. To assist him the dictator appointed a subordinate called *Magister Equitum*, master of the horse.

The first significant step which Rome took towards Empire was when she obtained control over the League of Latin Cities, of which she had at first been an equal member. This did not take place as a result of one battle or campaign, but only after many generations of strife; but it was certainly a fact by 338 B.C. Control of the Greek city-colonies in Campania was obtained about the same time, and within a short period the Etruscan power was also subjugated. By

the beginning of the third century B.C., Rome had control of all the Italian peninsula, though complete domination over some parts of it was not finally achieved until later; for example, the Ligurians in the mountain regions above the Riviera, and the Gallic tribes on the Alpine slopes were not completely subjugated until the reign of Caesar Augustus some three hundred years later.

In the course of this conquest of Italy, Rome adopted a policy towards the conquered peoples which was continued outside Italy and was the principal cause of her rise to Empire. She kept control of all foreign relations in her own hands, but interfered as little as possible in the internal government of the subject communities or tribes.

In addition she was most moderate in the burdens she placed upon her tributaries. The chief requirement was military service, which the primitive peoples were ready to give. Taxation was seldom imposed upon Italians, at all events. This politic moderation on the part of Rome explains why she was the only city-state which succeeded in founding a stable Empire.

The Greek city-colonies of southern Italy maintained a continual struggle against the Italian barbarians, and from time to time summoned Greek generals to their aid. In the article on the Battle of Zama it has been described how the Tarentines sent out a call to Pyrrhus early in 280 B.C. The eventual winning of this struggle by Rome completed her ascendancy in Italy. It also caused a rupture between the Romans and the Carthaginians, and after three great struggles Carthage was utterly destroyed.

The first of these struggles, the First Punic War (264-241 B.C.), was chiefly fought out at sea, and resulted in the first Roman annexations outside the peninsula. She seized the Carthaginian possessions in Sicily, and a little later Sardinia and Corsica, then dependants of Carthage.

In 230 and 219 B.C. wars were waged against the famous pirates of Illyria, and bases were set up on the shores of the eastern Adriatic. This brought Rome into political contact with Greece proper.

In the Second Punic War, Philip V of Macedon allied himself with Hannibal, and after the defeat of the latter at Zama in 202 B.C., Rome turned her attention to Philip, who was overthrown by Flaminius at the battle of Cynoscephalae in 197 B.C. In the following year, Flaminius declared the "liberation of Greece", and by following the traditional custom of Rome towards her subject peoples crippled Philip, despite the fact that he annexed none of his territory.

This campaign began a series known as the Macedonian Wars which spread over the next half-century or so. With various other wars engaged in on other fronts, such as the Third Punic War of 149-146, Rome's military resources were kept in constant use, and it is not surprising that the experience so gained brought to Roman arms a succession of victories which could not fail to enhance Rome's influence in the Mediterranean.

At the end of the contests with Hannibal only a narrow band of territory in Africa had been annexed; in 146 B.C. it was enlarged. The Third Macedonian War made an end of Macedonia as a monarchy; it became, instead, a province of Rome. From the time of the Second Punic War (which ended with Zama) the Romans had been engaged in strenuous struggles to establish their ascendancy in Spain, from time to time suffering great disasters. Now the capture of Numantia in 133 by the younger Scipio gave them more security there. In the same year, the last King of Pergamon bequeathed his territories to Rome, and they became the first Roman province in Asia. At the same time the first steps were taken towards the conquest of Gaul. In 124 Aquae Sextiae (now Aix-en-Provence) was founded, and six years later the Roman colony of Narbo (modern Narbonne) became the first organized Roman settlement outside the peninsula.

The latter part of this period, 133-121 B.C., was marked by the political developments which all their military activities made necessary. The measures introduced by the Gracchi brothers, and especially by the elder Tiberius Sempronius, were revolutionary, and one result was that the supremacy of the compact ring of noble families which had controlled the Senate was undermined.

The chief of these measures were the vindication of public ownership in the national estates, the constitution of the *equites* (knights) as a separate order, and the attempt to found great Roman colonies overseas. The younger Gracchus, Caius, proposed the enfranchisement of Rome's Italian allies. The Senate, however, refused to pass this measure, an act which was to have important consequences a generation later when, as a result of the Social War, all the cities of Italy acquired Roman citizenship by the *Lex Julia* of 90 B.C. The conception that men of Italian birth formed a people apart from the rest of the Empire was now definitely established.

By the beginning of the first century B.C.—when Julius Caesar was still in his infancy—Rome's overseas possessions comprised parts of Spain and southern France, bases on the Dalmatian coast, Macedonia and Pergamon, in Asia Minor, various strips along the

North African coast, and Sicily, Sardinia and Corsica. They were, in fact, extensive enough to make imperial development an easy achievement, for all that was needed was a powerful leader with certain ambitions to be fulfilled, for Rome to stretch out her tentacles to embrace more and more of the known world. No foreign power could hope to resist her encroachment; only internal dissensions could hold up the march of progress. Somewhat paradoxically it was the internal struggle for power which eventually made Rome the greatest imperial power the world has ever known. The chief protagonist in the struggle was Caius Julius Caesar.

Caesar was born on 12 July, 102 B.C., the only son of parents who both belonged to the old Roman nobility. Through his aunt, who had married the great democratic leader Caius Marius, he was, by Roman custom, the nephew of that outstanding man, and this fact doubtless influenced Caesar in his support of the popular party. The connexion with democracy was later strengthened when, in 83, he married Cornelia, the daughter of Lucius Cinna, on whom the mantle of Marius had fallen.

Caesar displayed no special ability in his early years, but with the democratic party in power he started his public career under favourable auspices. His refusal to divorce his young wife at the command of the tyrannical Sulla nearly cost him his life, and as his family considered Rome to be too unhealthy for him, they arranged that he should enter military service in Asia in 81. At the capture of Mitylene in 80, he won the Civic Crown, the Roman V.C., for saving the life of a fellow-soldier at grave risk to his own.

The death of Sulla in 78, opened the way for a return to Rome, and Caesar grasped the opportunity to gain some experience in the law courts of the capital. This he followed by a period of study under the famous rhetorician, Apollonius Molo of Rhodes, in order to improve his oratory. After another spell of military service in the war with Mithradates, he returned to Rome and plunged into politics in earnest as a consistent supporter of popular measures.

In 68 he became *Quaestor* (state treasurer) and in 65 *Curule Aedile* (magistrate) when he spent such enormous sums on the public games and buildings that he almost bankrupted himself, but greatly increased his favour with the people, which he was never to lose. He was now well set on his upward career, the first peak of which he reached in 59 by his election to the Consulship.

By allying himself with the two most powerful men on his side—Pompey and Crassus—Caesar introduced a number of far-reaching reforms all of which further integrated him with the people and



powerful *Equites*, so that he obtained the government of those provinces which he believed would help him best in the next step in his grand design—the command of an army which would be firmly attached to him by victories and rewards, with whose help he would achieve his ultimate goal, the supreme power in Rome. During the next nine years he occupied himself with the subjugation of Gaul with this object in mind, completing this part of his plan in three campaigns, the last in 55.

Now, his government of the Cisalpine and Transalpine Provinces and of Gaul was due to end in 54. In 55 he arranged with his two chief rivals—but at present his allies—Pompey and Crassus, that they should be Consuls for the following year, while his own period of government should be extended for another five years. Having settled that, he crossed the Rhine to strike terror into the Germans. He remained on the further bank of the river only eighteen days, but in that short period he was guilty of atrocities which it is impossible ever to condone.

Later in the summer of 55 he invaded Britain on a fact-finding mission. In the following year he devoted himself chiefly to a second invasion of Britain which ended with the submission of the natives. Their subjection was only nominal, however, for Caesar left behind no garrisons, and for nearly a century more the Britons remained independent of Rome.

By 53 the Roman "overseas" possessions, the Empire, had been greatly extended, and now included all Gaul, the greater part of Asia Minor, which had been subjugated by Pompey, Syria, the greater part of Spain. Gaul, however, was a continuing sore in the side of Rome, its peoples being in constant rebellion against the authority of Rome. It was Caesar's responsibility to subdue them, and it was in carrying out this duty that he showed himself to be one of the greatest military geniuses of all time.

Coincidentally, his prestige and popularity among the Romans increased, and Pompey was now beginning to realize that his own position was being seriously undermined. With the removal of Crassus by death in the Parthian campaign of 53, a straightforward struggle for power now began to develop between the two men, which came to a head in 48.

Chiefly on account of his flouting of the constitution to gain his ends, Caesar had made many enemies in the Senate. To these enemies Pompey allied himself and one result was his election in 52 as sole Consul. Caesar's *Imperium* was now approaching its end, and could not be legally renewed. He knew that as soon as his armies were

disbanded and he returned to Rome as a private citizen he would be impeached by the Senate.

To avoid this he demanded the Consulship for 48. But not daring to trust himself in Rome—for by the law no commander might bring his armies into Italy proper, but must keep them north of a little stream called the Rubicon—he also demanded relief from the customary personal canvass made by candidates for high office.

Pompey opposed this, and as the refusal to grant Caesar the concession he asked automatically put an end to his candidature for the Consulship, Caesar now committed his greatest breach of the law—he put his legions across the Rubicon and marched on Rome.

Civil war was now inevitable. But everywhere Caesar defeated Pompey, finally routing him at the battle of Pharsalia in August, 48. Pompey fled to Egypt where he was treacherously murdered.

Having had himself elected Consul in 48, and appointed dictator, Caesar set about implementing a great programme of administrative reform. While so engaged he had to wage campaigns against Pompey's surviving allies, but with the defeat of Pompey's two sons in Spain in 45, the civil war ended.

In this year Caesar was made dictator for life. He had now achieved his ambition, but he had not quelled nor appeased all his enemies. A plot against his life led by Cassius came to fruition when he was assassinated in the Senate on 15 March, 44.

Caesar had destroyed the Republic. Fortunately, he was succeeded by a man of tremendously constructive spirit, which he himself had never had.

Octavian, his great-nephew, had been adopted by Caesar as his heir shortly before his death. Absent from Rome when his uncle was murdered, he returned at once to the city to demand only Caesar's private property and to swear vengeance against his benefactor's assassins. Among his chief enemies eventually was Mark Antony, Caesar's erstwhile lieutenant, who saw in him the chief obstacle to his own ambitions. Octavian took up the challenge, and by 30 B.C. had defeated Antony and all his other enemies.

He was now master of the Roman world, but avoiding the unpopular title of king, he accepted the new title of Augustus. In other words he was the sole ruler of Rome and all her possessions, and in everything but name an absolute monarch and the first Roman Emperor. With this recognition of their ruler came the recognition of Rome as an Empire.

Whereas Julius Caesar had extended Rome's rule merely for personal ends, Augustus did so for the national interest, and set a

#### JULIUS CAESAR GAINS POWER IN ROME

trend followed by his successors, until by the reign of Trajan, A.D. 98-117, the Empire reached its greatest extent, embracing the greater part of the known Western world. It is doubtful whether but for the personal ambition of Julius Caesar Rome would ever have achieved her tremendous rôle and her inestimable influence on the future generations of those who came under her sway.

## *Actium*

### *The Battle that Determined the Cultural Axis of Europe*

CAESAR THE dictator was dead, murdered on the "Ides of March"—the 15th of that month—in 44 B.C., and with his death had come the hope of many of the people of Rome that their moribund Republic might be revived, ruled again by the Senate and the People of Rome. Indeed, it was partly for this—though partly, too, for jealousy—that the conspirators had plotted.

But when Caesar's will was opened, it was found that he had named a great-nephew, Octavian, his adopted son and heir. This was not—definitely not—to the liking of Mark Antony, Caesar's trusted, dissolute lieutenant, who had hoped he might step quietly into the dead dictator's shoes. Already there was feeling against him among the legionaries, a resentment that he had done so little to punish Caesar's murderers. Now, with a real blood-heir, a youth of eighteen swearing to avenge his uncle's murder, there was an object towards whom the soldiers of Rome could rally.

At first, relations between Antony and Octavian were correct, almost friendly—but there was little doubt in either mind that a battle was coming, for the succession. They formed, with Sextus Lepidus, the second of Rome's famous "triumvirates", but they knew Lepidus counted for little, that the future lay with them—or with one of them. Brutus and Cassius, the two chief conspirators—"Republicans", now—were in the East, preparing to fight either one or the other, or if necessary both, and now they assembled an army, marched it into Macedonia, the large northern state which in modern times has been divided between Greece and Yugoslavia, halted it on the Plain of Philippi. To Philippi went, as well, Antony and Octavian—the "Caesarians"—anxious to do battle: the sooner the better. Their army, vowing vengeance for Caesar, was more reliable than that of the enemy, but the Republicans had managed to assemble a navy which threatened to cut its supplies from Italy. Antony decided to force the Republicans to battle, and in this he was successful though rather less so in the fighting: while he was overcoming Cassius, Brutus was destroying his left wing. Cassius,

not knowing that his ally had scored a victory, committed suicide.

This first battle, though technically a draw, disposed of the Republicans' better general. The second battle of Philippi, a few days later, with only Brutus to command the Republican forces, resulted in a definite victory for the Caesarians: Brutus, too, committed suicide.

These two land battles decided the form of government Rome would have: it could only be an autocracy, ruled by one man—or at most a few—not a democracy, ruled by its people. But of the two contenders—which would succeed? At first it seemed they might agree to work together, sharing the Empire, with Octavian taking the West, Antony the East, Lepidus the Province of Africa; but when Octavian returned, after Philippi, to Italy, and Antony went straightway to Egypt and became the lover of Cleopatra—as had Caesar before him—the seeds of the final conflict were sown. It would take ten years—but it would come.

At one stage, with war imminent, the two patched up their quarrel: Antony even agreed to marry Octavian's sister. The respite was short. He repudiated the sister, married Cleopatra, named her "Queen of Kings". Caesarion, her young son by Julius Caesar, he styled "King of Kings". Not content with this, he named his own three children by Cleopatra rulers of half the Roman world.

It was this last, sweeping, foolish gesture which enraged the people of Rome. No longer was the impending battle to be one between two Romans: it would be between Rome and Egypt, and if that were the case, they knew where they stood. Octavian, sensing this mood, was able to seize Antony's will, read it aloud to the Senate. To the Senate's horror they learnt that, apart from all this ennoblement of Egyptians, Antony was bequeathing them "enormous presents".

This was too much. What if one of the "enormous presents" were the city of Rome? A campaign of hatred was launched on Cleopatra, a campaign such as the world had never seen. Every sort of accusation was hurled at her—many of them to stick, so that even to-day there are people who believe Cleopatra to have been a sorceress who bewitched Antony, a beast-worshipper, harlot, traitor, poisoner.

The propaganda worked: soon all Rome was up in arms. Skilfully, Octavian arranged that the Senate declare war on Cleopatra, not on Antony, and decree that any of Antony's men—even Antony himself—caring to join Octavian would be given a full pardon. He knew well that he was declaring a fight with his rival, that there was no likelihood of Antony refusing to fight by Cleopatra's side.

He was right: the lovers took up his challenge and moved, in 33 B.C., to Ephesus, on what is now the Turkish coast opposite the island of Samos, assembling there an army and a fleet. From Ephesus they moved across to Athens, where Antony received a message from his supporters in Italy—of whom there were many—urging him to get rid of Cleopatra; the war was not his, it was hers, he should refuse to take part. But this was impossible; he had tied his fortunes to those of the Egyptian Queen—it was too late now.

Antony's army moved over to the west coast of Greece, his main force occupying the promontory of Actium, the south side of the entrance to the Gulf of Ambracia, and immediately opposite what is now the Greek town of Preveze. Here he built a fortified camp, sat down to wait.

To military historians this has seemed a strange manoeuvre. With its long line of communication from Egypt (all corn came from Egypt: there was none to spare in Greece), a line which had to be guarded by a string of forts along the coast, it was stupidly placed for an invasion of Italy, the nearest point of which was over a hundred miles away. To invade Italy, which would have been the best way of defeating Octavian, Antony should have taken up position farther to the north, much nearer the Italian coast, in what is now Albania.

But in fact Antony could not invade Italy: if he took Cleopatra with him, every man's hand would be against him; without her, he had insufficient men, money, equipment. He had taken up Octavian's declaration of war—but Octavian would have to come.

Octavian did. He mobilized his army and fleet on the heel of Italy: 80,000 foot soldiers, 12,000 cavalry, 400 ships. The larger of these were armed with catapults for firing the "harpax", a harpoon attached to a windlass which, when it struck an enemy vessel or tangled in its rigging, held fast, could be used to drag the vessel close, so it could be boarded by soldiers. Octavian would command the army, and his trusted lieutenant Agrippa the fleet.

On Antony's side there were rather over 60,000 foot soldiers, 12,000 horses, 480 ships. He felt reasonably confident that when Octavian came he would defeat him, fling his troops back into the Ionian Sea; but he reasoned that it would be months before he came.

He was startled when Octavian attacked him, early in 31 B.C. The Admiral, Agrippa, crossed the Ionian Sea, captured a large number of Antony's grain and munition ships making their way up the west coast of Greece, while Octavian and his transports landed north of Actium, marched rapidly and set up their fortified camp

just five miles from it, which they linked with a sea base at Comarus by a road protected by high walls. Antony and Cleopatra, still in winter quarters, not yet ready to fight, hastily fortified a camp two miles south of Actium, and like Octavian, joined it to a coastal supply base by a walled road. No sooner had they done this than Agrippa struck again, captured many more of the supply vessels and at the same time several of the coastal fortifications designed to protect them. Antony was now cut off from Egypt and all his supplies.

To stay still would be suicide: within weeks they would starve. He took the only decision open to him, crossed the straits of Actium and quickly built a new camp only two miles from Octavian's. If he could attack his enemy and at the same time cut off his water supply from the Luro River, just behind him, he stood a chance of victory.

He failed. The troops he disembarked at the mouth of the Luro deserted to the enemy, their ships likewise. Now, with his fleet badly mauled, badly shaken, by Agrippa, Antony considered jettisoning it, withdrawing overland to Macedonia where he could fight with his army in the open, if Octavian would follow. Cleopatra rejected this scheme and won her point: the war would be decided by a naval battle. (Yet it would seem that while she was making this stipulation, she was preparing to flee, was planning, so Plutarch tells us, to dispose her forces, "not where they would be helpful in winning the victory, but where they could most easily get away if the cause was lost.") Deserters—of which there were many—explained this to Octavian and now he and Agrippa decided to draw up their fleet in line of battle facing the strait and wait for Antony's fleet to come out—whether it intended to fight or to run.

Early on the morning of 2 September, 31 B.C., Antony's fleet came out, rested on its oars, waited for the wind. It got up at noon and now both Antony and Agrippa raced to outflank each other, leaving their central squadrons to fight head on. In this encounter, Antony almost immediately lost a dozen ships, had his own flagship grappled, held fast, by a harpax. As Agrippa's ships were lighter, more mobile, than his, they were able to dodge between them, avoiding his long-range missiles and the huge boulders he could drop or hurl from his artillery turrets. Just before coming to grips, Agrippa's small ships would backwater with astonishing agility and then either ram the enemy ship again, crippling it, or row speedily away and attack another. In this way they sank many, while Antony for his part was trying to hit them with showers of stones and arrows,

flung from the high towers which his larger ships carried. As Dio has put it: "Each gained advantage over the other; the one party would run in upon the lines of oars projecting from the ships and shatter the blades, and the other party, fighting from the higher level, would sink them with stones and engines."

All along Antony had been frightened of his own badly shaken fleet—he had wanted to fight on land—and now the worst he had feared took place. Three squadrons of his centre and left (each squadron of sixty vessels) suddenly backwatered and raced for harbour, while two more from his own, right, wing did the same but found themselves unable to enter the Actium strait because Cleopatra's squadrons, at the rear, were blocking the way. They raised their oars in surrender.

This was the end. Antony signalled Cleopatra that the battle was lost, but—so it seemed—almost before she got the signal she had hoisted the purple sails of her own *Antonia*, was racing for the open sea.

Chaos came. Some ships were still at grips with the enemy, many of them tied to him by the dreaded tentacles of the harpax, but those that were not made panicky preparation for flight, pushing their heavy turrets over the side, hoisting their sails. It was these ships, caught in a state of undress, that Agrippa now set upon and destroyed, leaving those that had got sails up, and started, to get away. His own ships were without sail (which made them more manoeuvrable) and now, before the enemy could hoist their own, Agrippa fell upon them, crushing oars, tearing off rudders, boarding the crippled ships and engaging in hand-to-hand combat with Antony's men, who fought back—desperately—with boathooks, axes, stones.

Then Agrippa's sailors shot flaming arrows into the enemy, setting fire to his ships, fires they stoked with pots of charcoal and pitch which they catapulted on to the decks, while Antony's men, trapped in each floating inferno, screamed as they fought their way through boiling pitch, only to be slaughtered as they reached the gunwale.

Antony, his flagship held fast by an enemy harpax, leapt on board another and fled with the pitiful remnants of his fleet, fled as fast as the wind would take him, in pursuit of Cleopatra. When he caught up with her and boarded the *Antonia*, he sat down, Plutarch tells us, "in silence, holding his head in both hands", and refused to speak to her for three days.

When the ship put in at Cape Matapan, Antony was sufficiently



recovered to send messengers to his army, ordering it to withdraw through Macedonia into Asia.

He was destroyed as a man by this catastrophe—his fleet wiped out, his army fleeing into Asia—but Cleopatra sailed into Alexandria Harbour with her ships garlanded for victory. This was a trifling setback: very soon she would attack Spain, seize the tin mines. The world was hers—for the taking.

But less than a year later, Octavian was in Egypt. Antony made a desperate attack on his advance guard, won a fleeting victory, but on the next day lost half his troops and ships to the enemy. Now, utterly dejected, hearing a rumour that Cleopatra was dead, he stabbed himself. But when he was carried into the room where she had locked herself, it was only to find her alive and to die in her arms.

A few days later, when Cleopatra learnt Octavian would take her in triumph to Rome, she planned to thwart him. She was now his prisoner, so in order to do so she had to arrange for a basket of figs to be smuggled into her, containing among them two or three small snakes—the Egyptian asp. Holding one against her breast she died from its bite. Her last request was to be buried beside Antony, and this Octavian granted.

Although in many ways it was Philippi which established Octavian's power, his defeat of Antony at Actium is of far greater historical importance. Had Antony and Cleopatra won, they would have transferred the capital of the Roman Empire from Rome to Alexandria, which was a better site, both commercially and strategically. Had there never been an Actium this might still have happened. Had it happened, a cosmopolitan world empire, of the sort dreamed of by Alexander, would have grown up: the cultural axis of Europe would have changed. It is unlikely that Western Europe would have been Latinized, that the Christian religion would have been able to take root. In later years the Roman Empire was to split into an Eastern and a Western half, but by the time this took place both these things would have happened.

Actium, in short, is one of history's most decisive battles—perhaps the most decisive of them all.

## *The Teaching of Jesus*

### *Christianity is Born in the Middle East*

IN THE year 4 B.C., Rome was flourishing in the golden age of Caesar Augustus. Though not yet expanded to its fullest extent, the Empire included all the Mediterranean lands, including Palestine. Indeed, Palestine had been benefiting from the *Pax Romana* for more than half a century, and though the Jews had once or twice tried to throw off the Roman yoke, they had not succeeded.

A proud and active people, they chafed under the rule of Roman Governors, but they were not unaware of their limitations, and at this time, probably more than any other, they were looking forward to the appearance among them of a miraculous king, a Messiah, who would free them from the bondage of Rome.

Such a king had been a part of Jewish religious belief for several centuries, for the Romans had not been the first foreign power to subjugate them. They held that one of their great prophets, Isaiah, had foretold the coming of such a king.

Isaiah had lived in the eighth century B.C.—at the very time that the city of Rome was being founded—and he had foretold the subjugation of the Jews by Babylon, which occurred some two hundred years after his death. From the time of the Babylonian captivity (586 B.C.) the Jews suffered from succeeding foreign conquerors, and during all this time they had consoled themselves with the hope of the Messiah.

In religion, the Jews had long been distinguished from most of their ancient contemporaries by believing in and worshipping one God, as compared with the many gods of the Greeks, the Romans and the Assyrians, for example. This God, Jehovah, was all-powerful, a jealous God who punished if his commands were not implicitly obeyed. The Jewish prophets presented world history as the moral judgment of God on mankind.

This conception of God naturally regulated the Jewish attitude to life. Jehovah demanded that Man should live in righteousness. Goodness is the road to God, and by the same road God sends happiness in exchange.

From this they developed the view that the exchange is not Man's right, but comes to him by the favour of Jehovah, and that this favour can only be obtained by Man obeying God's commands implicitly; that is, by serving God.

Jewish national life was controlled by these beliefs, and it is interesting to notice that throughout their long history of subjugation by foreign powers they struggled not for political freedom but for the right to worship in their own way. This right was almost always accorded to them.

In practising their religion they had gradually built up a strict code of religious observances, in which ritual and ceremonial played a great part. The central point, the focus, of the religion was the Temple in Jerusalem. The destruction of the Temple—which happened several times in Jewish history—was always regarded as the most severe of all punishments which God could inflict.

The Temple and the local synagogues were administered by the priests. The priests constituted a special class in the community, and for many centuries they were drawn from one clan only, the Levites, the office being passed down from father to son. About 500 B.C., when certain reforms were undertaken, a higher order of priests was introduced, with a high priest at the head of them. This higher order of priests administered the Temple, and had a far more powerful influence in the lives of the people than their political leaders.

To maintain this influence, they insisted on the strict observance of religious rites and festivals—the Law and the Prophets, as laid down in the Scriptures. The festivals punctuated the Jewish year to mark historical events, such as the Passover, which celebrated the exodus from bondage in Egypt, and so on. With the reforms of 500 B.C., however, a new festival was introduced. Called the Day of Atonement (the seeking of divine forgiveness for sins) and now familiarly known as Yom Kippur, it is thought to commemorate the day on which Moses came down from Mount Sinai with the Tables of the Law and proclaimed forgiveness for worshipping the Golden Calf. (The story of this can be found in the Old Testament, the Book of Exodus chapter 32 and chapter 34.)

At the time of the great festivals, the priests required as many Jews as possible to make a pilgrimage to the Temple. Those who made such a pilgrimage and performed certain sacrifices when they reached the Temple could have a greater hope of forgiveness than those who did not.

These rules and regulations, like every other, were designed to

give to the priests a greater power over the people than they might otherwise have achieved. It must be stressed that in their belief that Jehovah was the only One True God, the Jews held that all who did not worship Him could not hope for salvation; and that salvation could only come to the Jews if they obeyed the Law and the priests.

This, then, was the religious situation when in 4 B.C. there was born in the village of Bethlehem, about five miles south-west of Jerusalem, a boy who was given the common Jewish name, Jesus.

According to the accounts of the birth, life and teaching of Jesus contained in four short documents known as the Gospels—"good news"—the birth of the boy was accompanied by certain miraculous events.

His mother was Mary, wife of a carpenter called Joseph, who lived at Nazareth. Shortly before they were married, Mary had been visited by an angel who had told her that the Holy Ghost would come to her and she would conceive; and though she came to Joseph a virgin, she was actually pregnant when they were married.

Shortly before the birth of Mary's baby was due, the Emperor Augustus decreed that a census of all the inhabitants of his Empire should be taken. For this purpose, every man was to return to his birthplace to be counted.

Joseph's birthplace was Bethlehem, and he set out from Nazareth with his wife. When they arrived at Bethlehem, they found that all the public accommodation had already been taken and that the only place that could be offered them was a stable at the inn. Here the baby was born.

The birth was accompanied by a number of supernatural happenings: the appearance, to a party of local shepherds, of a choir of angels, and the arrival of wise men from the East who had been led to Bethlehem by a moving star. The latter had been told in dreams that a king was to be born in Bethlehem who would lead the Jews out of their present bondage, a declaration which they interpreted literally, though the actual meaning was symbolic—that He would lead the Jews out of their rigid religious bondage to a state of spiritual salvation.

According to the author of Matthew's gospel, Herod, the King of Judaea, also heard this news of the birth of a King. To avoid trouble in the future he first tried by a ruse to have the baby brought to him. But when Joseph heard that Herod was searching for the boy, he fled with his wife and the child to Egypt, and remained there until Herod died; while Herod, determined to rid himself of this threat to his throne, ordered the massacre of all the male

children in Bethlehem who were two years and under, hoping thereby to include Jesus.

The next we hear of Jesus is on His achieving the status of manhood at the age of twelve. Following religious custom, Joseph went up to Jerusalem at feast-time to worship in the Temple. On the journey home, they found the boy missing, and on hurrying back to Jerusalem discovered Him in the Temple arguing with the theologians there.

When Joseph rebuked the boy for not staying with the family, Jesus replied, "Did you not realize that I must be about my Father's business?" thereby demonstrating that from infancy He was conscious of having been sent into the world from God to accomplish some specific task.

For the next eighteen years, however, He lived in Nazareth in obscurity, working as a carpenter. After the death of Joseph it is probable that as head of the family He supported His mother and brothers and sisters.

When He was not quite thirty, His cousin John began to make a name for himself in Judaea as a prophet. John's preaching foretold the coming of a saviour, of a Messiah, of *the* Messiah as preached by Isaiah five hundred years earlier.

It seems that Jesus realized now that John was referring to Him, and that He must begin the special work for which He had been born. So He went to John, and was baptized by His cousin in the river Jordan.

Gathering round Him a few young disciples, He began at Capernaum, on the Lake of Tiberias, in Galilee, a ministry of teaching and healing.

The main theme of His preaching was the coming of the Kingdom of God on earth. In parables which attracted both attention and curiosity, He described the nature of this kingdom or rule of God which He had come to initiate. At the same time by restoring the sick to health, by feeding the hungry and raising the dead to life, He demonstrated the divine mercy which was so different from the jealous and awful judgments which Jehovah passed on those who did not obey His commands.

The true God was a God of mercy and forgiveness; and His own rôle was that of the Saviour of mankind from the results of their sins.

The essence of His teaching is to be found in what we now call the Sermon on the Mount. Beginning with the nine Beatitudes (Blessed are the meek, the poor in spirit, they that mourn, that seek

righteousness, the pure in heart, the peacemakers, the merciful and those who are persecuted for the faith) and including the Lord's Prayer, the Sermon sets out clearly Christ's moral code, which may be summed up as: Love your enemies, tolerance, honesty, simplicity, meekness.

This teaching, if not in direct conflict with the teaching of the priests, was so different from it and so appealing in its freshness of concept—that God is Love—that people were drawn to Him and collected in great crowds wherever He went. This naturally brought Him into collision with the religious authorities who recognized that if His influence spread it could mean the end of their own doctrinaire teaching and destroy the privileges which the ancient system granted them; in other words, it threatened their authority over the people.

From the early days of His ministry, therefore, the religious leaders determined to put Jesus to death.

For His part, Jesus recognized that only through death could He accomplish His task—the seed must fall into the ground and die in order to live.

He had always made a practice of going to Jerusalem for all the festivals, and visited the Temple for the Passover in the third year of His ministry He was conscious that the end was very near. By raising Lazarus from the dead and by cleansing the defiled Temple, He deliberately provoked the priests to action against Him.

Through the treachery of one of His disciples, Judas Iscariot, He was quietly arrested after praying in the Garden of Gethsemane; an illegal trial was hurriedly held during the night; and on the morning of the Feast the religious authorities demanded that the Roman Procurator, Pontius Pilate, should authorize the crucifixion of their victim.

The Roman sense of justice at first rebelled against this application to have murder judicially approved and permitted, for Pilate had seen behind the arguments put forward by the religious authorities and had observed that they were not valid. However, when the High Priests threatened to denounce Pilate to his jealous and suspicious Emperor, Tiberius, Pilate agreed, though he made a show of refusing responsibility for the judgment. So Jesus was crucified on Mount Calvary probably in A.D. 29 or 30.

This is the full extent of the historical life of Jesus as we know it. His disciples claimed, however, that after His body had been three days in the tomb, He rose again, and the Gospels give accounts of several appearances which He made to various of His followers.

## *Constantine the Great Adopts Christianity*

### *And Makes It the Dominant Religion in Europe*

ON 25 JULY, A.D. 306, the Roman Emperor Constantius Chlorus died at York, and the same day the soldiers of York garrison declared his son Flavius Valerius Aurelius Constantinus to be his successor on the Imperial throne. Constantine, as he was subsequently called, was still in his teens, but he was already exhibiting those qualities which have persuaded later history to add "the Great" to his name.

The Roman Empire of these times was not at all like the Empire of the Classical period. Certainly the Imperial territories covered a vast area, and included Britain, Gaul, Spain, Italy, the modern Yugoslavia, Rumania and Bulgaria, the modern Switzerland and Austria, Greece, Asia Minor and Palestine, and the whole North African margin of the Mediterranean from Egypt to the Atlantic.

It was because it was so vast that it was difficult to administer as one unit, and it will be noted that it fell into two natural halves which differed from one another greatly in characteristics. Before the Romans had dominated the Mediterranean, and spread their influence throughout western Europe and to the East, the Greeks had flourished. When their power had declined, Greece and her former possessions had been added to the Roman Empire, but the way in which Rome administered her Imperial possessions left the peoples of the subject nations with their national characteristics intact. It is true that Roman influences made a formidable impact on all the people over whom Rome held sway, but the people of the East were to remain completely different from the people of the West, as indeed they have remained to this day. It was this difference, which was to be seen most clearly in the two cultures and in the personalities of the actual people, which, as we have said, naturally created a division within the Roman Empire.

Successive Emperors had found increasingly difficult the task of keeping their vast possessions, with their many different nationalities, in check, and when the Emperor Diocletian found the barbarians on his Empire's frontiers continuing to constitute a threat of invasion, he

decided that if he was to keep them off effectively he must devote much time to this work. So much time, in fact, that he would be unable to oversee efficiently the many aspects of government.

So, in 286, he decided to appoint Maximian as a colleague, and assign to him the Western portion of the Empire. This arrangement was followed by a further division in 292, when Constantius Chlorus and Galerius were appointed Caesars, Constantius for the West and Galerius for the East.

On the death of Constantius and the appointment of his son Constantine as his successor, Galerius, who on the abdication of Diocletian in 305 had assumed the title of Emperor of the East, agreed to recognize Constantine as Emperor in the West, with sovereignty over all the countries beyond the Alps.

About this time there were no fewer than six claimants to the Imperial throne, three in the East and three in the West. Maxentius, the son of Maximian, with the support of the Praetorian Guard, the élite body of Roman troops whose rôle was to protect the person of the Emperor, and who, over the years, had frequently elected the Emperor, seized the power in Rome.

A contest between him and Constantine became inevitable, and the two met at the Milvian Bridge, over the Tiber, on 27 October, 312.

It is not certain whether by this time Constantine had personally accepted Christianity. His mother Helena was a Christian of long standing, and it is more than likely that she had made efforts to convert her son.

However, shortly before the battle at the Milvian Bridge, he had had a dream in which he had seen a fiery cross in the sky, and the legend *hoc vince*—"by this conquer". As a result of this dream he decided to stake all on the coming battle, and ordered his soldiers to put on their shields the Greek letters  $\chi$  which formed the monogram of Christ. The battle ended in the utter defeat of Maxentius's forces and in their leader's death, which left Constantine master of the Empire in the West. One of his first acts was to have the Christian monogram added to the Imperial standard and to decree that in all the territories over which he ruled the Christians should be granted toleration.

The spread of Christianity from the days of the Apostles had been extraordinary. Throughout all the Empire of the East there were a multitude of scattered pockets, while in the Empire of the West in those parts which bordered on the Mediterranean a similar situation existed.



Christ had Himself appointed Peter to be the head of the Church which He had charged the Apostles to establish, and it is an historical fact that Peter had decided to carry his personal mission to Rome, the capital of the Empire. Here, traditionally in A.D. 42, he was executed during one of the many persecutions of the Christians, whose growing influence the Roman Emperors greatly feared.

Before he died, Peter had become the supreme head of the Christian Church, and when Jerusalem was destroyed in A.D. 70 the Church in Rome came to be regarded as the headquarters of the Church everywhere, and the leader of the Roman Church was regarded as the chief priest, or Pope.

Between A.D. 90 and 305 there were no fewer than ten violent persecutions of the Christians; but far from losing influence, the Church gained in power, and the number of Christians throughout the Empire increased. As the Latin writer Tertullian put it, "The blood of the martyrs is the seed of the Church."

With the expansion of the Church, between the death of Peter and the accession of Constantine, it had developed a kind of organization, which may be described as a loose confederation of self-governing communities (in matters relating to the Church only, of course) held together by the unity of the faith and the spirit of brotherhood which membership of that faith engendered. Its "churches" were mostly city communities, for it was in the cities that the Word had first been preached. There were, however, a number of rural communities existing on the greater estates.

At the head of each church was a Bishop, elected by the community, and each Bishop considered himself to be a successor of the Apostles. The Bishops alone in the early days possessed the power of "laying hands on the Bread and Wine" which were used in the regular celebration of the Last Supper. But as the Church grew, the Bishops increasingly found that they were unable to administer both the religious and administrative departments, and they in turn appointed Presbyters to assist them, each Presbyter being in charge of a district within the greater area served by the Church. In his administrative duties, the Bishop was assisted by Deacons. It was in this way that gradually the organization and administration of the Church came into being.

Although as yet there was no central organization of the Church, the successors of Peter as Bishops of Rome were regarded as the supreme heads of the Church on earth. This did not prevent there growing up among churchmen differences of opinion concerning many aspects of Christian doctrine. Indeed, it can be said that the

fact that each church was self-governing encouraged individual thinking, from which sprang varying interpretations of the fundamentals upon which the religion was based. When such differences assumed such proportions that the spread of them could be expected to influence the overall teaching of the Church, the matter was referred to the Bishop of Rome for his decision, in the same way that very early fathers had asked the Church in Jerusalem to decide. But the Bishop of Rome had no authority to enforce his decision or interpretation on other churches, with the result that when the dissidents felt very strongly about their own interpretation, they ignored the Bishop of Rome's decision.

By Constantine's day, a surprising number of differences of this kind existed. These heresies, as they were called, threatened even the unity of brotherhood of the Church, and as we shall see presently, Constantine decided that they must be settled if the Church was not to become extensively weakened; and by this time he had begun to realize that Christianity could become the means of making the Empire stronger. It happened like this.

Galerius had abdicated in 307 and had been succeeded as Emperor in the East by Licinius. Licinius had a strong dislike for the Christians, and had embarked upon persecutions of them in his own domains. These persecutions naturally upset the Christians under Constantine's rule, and since by this time he had become convinced that it would be preferable for the Christians to be his friends rather than his enemies, he invited Licinius to a conference in Milan to discuss the Christian Question. He was able to persuade Licinius to stop his persecution of them.

On Licinius's part, however, it appears that this was merely a delaying tactic, for he was ambitious, and had set his heart upon becoming sole Emperor of the combined Empires of East and West. Immediately after the Conference of Milan he embarked upon a series of provocative acts which virtually compelled Constantine to challenge him, and war broke out between them in 314. The outcome was indecisive, though it did show Licinius that Constantine was stronger than he had estimated. There followed an uneasy peace between them, and though this lasted for nine years, during which time Licinius desisted from his persecutions, a final struggle for supremacy was inevitable.

Constantine used the period of peace to consolidate and increase his strength and position, and one of the means he employed was to do all he could to make the position of the Christians within his Empire as secure as possible. In seeking to acquire their friendship,

he began to take a personal interest in their affairs, and it was on his orders that a Council of Bishops met at Arles in 314 to pass judgment upon a heresy which was splitting the Church in Africa.

In 321, Licinius renewed his persecution of the Christians with increased ferocity, and as the Champion of the Christians within his own Empire, Constantine decided that he must take such steps as would at least demonstrate to his own Christians that he was prepared to aid their co-religionists wherever they might be. In fact, it would not be incorrect to suggest that Constantine's real motive was to challenge Licinius for the supreme power.

In 323 the two Emperors met in battle, first at Adrianople. Here Licinius was defeated, but he rallied his forces and challenged Constantine once more at Chrysopolis, now called Scutari. Here he was decisively beaten, and was taken prisoner, and afterwards executed, leaving Constantine in sole command in both the Empires.

The political division between the two parts of the Empire had widened the natural differences between them, and Constantine saw that what was needed was some unifying factor that would bring the two parts more closely together. Common both to the Empire of the West and that of the East were the Christians, who by this time had greatly increased in numbers. If he made the Christians the unifying factor which he believed to be essential to form the united Empire into a cohesive whole, then steps would have to be taken to enhance their religious position.

Unfortunately for Constantine, at this very point in time, the whole of Christianity within the Empire was embroiled in a controversy which threatened to split it permanently. This was exactly opposed to what he wanted, for if the Christians were seriously split among themselves, how could they become the unifying factor for his Empire.

The controversy was known as the Arian heresy. Though some scholars contend that its origins can be traced to the teaching of Paul of Samosata, the heresy was first defined by Arius, a priest of Alexandria. Its most ardent opponent was Athanasius, also a priest of Alexandria, which had pretensions to becoming the rival of Rome as the headquarters of the Church.

Put simply, the Arian heresy denied that Christ was equal to or of the same substance with God the Father. The Eastern Christians held firmly to the separate Person of the Redeemer without defining too plainly the sense in which the Father and the Son were One God. Arius upset this widely accepted doctrine by stating categorically that the Son and the Father were quite separate. He based his

thesis upon the argument that before the appearance of Christ there had been eternity, and that the Son had been begotten by a once lonely Creator, and that the human body of Christ, through the Sonship which divine parentage had bestowed on Him, that is, the Incarnation, had become the receptacle of the Word, the essence of Christian philosophy.

Under Athanasius's prompting the Bishop of Alexandria summoned a small Council of Bishops, who decided that the teachings of Arius were false, and banished him to Palestine. The result of this was that instead of stamping out his heresy, more and more Christians in the East began to support Arius, and by 324 it was quite clear that unless an incontestable decision were taken quickly the whole Eastern Church would split into two warring camps. This would make it impossible for there to be a complete union of all Christians everywhere.

So in 325 Constantine intervened. He called all the Bishops of the East to meet him at Nicaea. Three hundred Bishops answered his summons, while the Bishop of Rome sent representatives, chief among whom was the Bishop of Cordova, who was an intimate friend of the Emperor. After long debate, in which Arius took part to defend his doctrine, an overwhelming majority pronounced him to be in error. Arius was banished to Illyria and his adherents exiled.

For the time being the threat of a split disappeared. Constantine could now go forward with his plans. Though Arianism was to be troublesome to several of his successors, the Council of Nicaea firmly established the authority of the Church, so that when Constantine declared complete toleration for Christians throughout the Empire, he took the first great step in making Christianity the predominant religion in Europe. It was a step the consequences of which for the future of Europe it is impossible to evaluate.

## *The Destruction of the Roman Empire*

### *Teutonic Tribes Spread Out Through Europe*

THE HISTORY of civilization is, in reality, an account of the dominance of one nation after another. A nation rises to great peaks of power and civilization, establishes an empire over all the second-rate nations within its reach, passes through a relatively short period of majestic greatness, and then begins to decline towards mediocrity, or a position of no account, or annihilation. From time to time during this downwards progress there are moments of apparent rebirth, or rather a renewal of strength and virility, which seem to hold the seeds of hope. Such upsurges of power, of new vigour, invariably prove to be the last flickers of authority condemned to extinction; their life is short, and when they die out, they leave the crumbling edifice of empire weaker than ever.

The great and magnificent Empire of Greece, which reached its peak of greatness during the period when Pericles of Athens was at the head of affairs, had already lost all claims to greatness when its neighbour to the west began to emerge as a potential Imperial power. From the foundation of their city in 753 B.C., the Roman people had been compelled by an ever-increasing need for living-space to extend their frontiers. In a long and slow process covering seven hundred years, they conquered near neighbours and distant peoples, continuously extending the area over which their authority was effective. Simultaneously with this territorial aggrandizement they developed a civilization which formed a stable foundation on which to build the edifice of empire, so that when they were at the peak of their authority they were also the leaders of culture.

The date at which Rome may be said to have assumed Imperial status was 31 B.C. In this year, the young triumvir Octavian defeated at Actium his colleague Antony, and Antony's ally, Cleopatra, who had made a bid for supreme power. Octavian's other colleague Lepidus, had already been forced by him into seclusion, so the Roman world, after years of struggle, was at last in the hands of a single man.

Octavian's authority was unchallengeable, for he commanded

both the Army and Rome's financial resources. Assuming the name Augustus, which presently became the title of Rome's chief ruler, by wielding an iron fist in a velvet glove, he gradually made his position unassailable and towards the end of a long reign he held sway over Spain, France and the Low Countries to the Rhine, Italy and the territories between the Danube and the Alps, the whole Balkan peninsula including Greece, Asia Minor, Syria and Palestine, and the North African coast from Egypt to the Atlantic. Such were the forces at his command that no barbarian was tempted to challenge him; and when he marched none but the Germans was able to resist him.

Augustus was without doubt the greatest among Rome's rulers, and in no branch did his genius excel more than in organization and administration. He formulated for Rome a method of government which, if she adhered to it, could not fail to maintain her Imperial greatness.

Before he set about expanding his Empire he indulged Rome in a period of peace which lasted for almost twenty years. Peace automatically brought prosperity, which was promoted by the new security and freedom of intercourse in the whole Mediterranean area, an intercourse stimulated by the great road-construction scheme which Augustus inaugurated throughout the Empire.

One of the means by which he persuaded the Romans to accept his rule was an astute use of traditional religion. The Romans were an inherently pious people, and when Augustus encouraged the performance of ancient rites and the restoration of crumbling temples, he completely won over the large majority of his ordinary subjects. Gradually he introduced an innovation. On the death of Lepidus in 12 B.C., he took over the office of chief priest as well, and as time passed began to hint that the Roman ruler was, in fact, divine. However, he was not officially proclaimed a god until after his death.

This occurred in A.D. 14, and though he hoped he had introduced a dynasty which would automatically succeed him, he was followed by four rulers—Tiberius, Caligula, Claudius and Nero—who enveloped the Imperial throne in murders, persecutions, vengeance and suicides. After the suicide of Nero in A.D. 68 there were no fewer than four emperors in one year—Galba, Otho, Vitellius and Vespasian. The latter founded a new ruling house, and in the ten years of his government (during which his son and successor Titus captured Jerusalem and destroyed the Temple in A.D. 70) he was able to restore some kind of stability to Rome and Roman rule.

But the glory of the age of Augustus was not to be regained until the reign of Antoninus Pius and his successors, between A.D. 138 and 180, which was a period of widespread prosperity, comfort and happiness unknown at any other time in Rome's history.

This splendid period came to an end with the assassination of Commodus in 192, and once again a struggle for power resulted in a rapid succession of Emperors, most of whom met violent ends. The last of this line of Emperors was Caracalla, who attempted to win laurels in the East. When he was murdered, in 217, he was succeeded by his fourteen-year-old second cousin, the hereditary priest of the Syrian Sun-god, El Gabal, who took the name of Elagabalus and who introduced into Rome's history one of the most curious and fantastic administrations imaginable. When he was murdered in 222, he was followed by his brother Severus Alexander, and though Alexander held the title of Emperor, the real ruler was his mother, Julia Mamaea, a very wise woman.

The murders of mother and son in 235 were followed by many other troubled successions. In the space of half a century, twenty-two Emperors were recognized in Rome, and as many more in the provinces.

By this time, it will come as no surprise to learn that the Roman Empire had gone into a decline. This was made inevitable by the continuous struggle for power which prevented any stability from being brought to administration and organization. Nevertheless, there came to the Imperial throne from time to time men of parts determined to fight back.

Roman authority reached its lowest ebb in A.D. 260. It was inevitable that the disorder into which the Empire had fallen should beckon Rome's enemies, the most persistent of whom were still the Germans at the east and west ends of the Danube frontier. Dacia had to be abandoned to them by Decius, while, under his successor Valerian, the Goths, Alamanni and the Franks penetrated as far as Asia Minor, Spain and the Auvergne respectively. It was during peace talks with the Sassanid king Shapur that Valerian was kidnapped and presently died in captivity.

His son and successor, Gallienus, came to the throne in Rome's darkest hour so far in her history, and he faced many raids by the Goths as far as Asia Minor, and by the attempts of many usurpers—this period is known to historians as that of The Thirty Tyrants—to seize the Imperial power. Temporary régimes came into being, and included an Empire of the Western Provinces Postumus, and a large state governed from the Syrian caravan oasis of Palmyra.

All these difficulties with which he was beset did not deflect Gallienus from his determination to bring the Empire back along the road to glory. As a constant reminder to the people of his intention to this end, he had the slogan *Peace Everywhere* inscribed on his coins. In some strange way, the journey back was initiated and in the face of superhuman odds the goal was achieved, chiefly by the operations of four Emperors, all appointed by the Army. Claudius II annihilated the Goths at Naissus; Aurelian, the Restorer of the World, decided to give up all claim to Dacia, but restored the Danube frontier, and overcame the fourth invasion by the Alamanni. In addition, he defeated the highly intelligent and scholarly Queen Zenobia, who from her state of Palmyra had seized the Eastern provinces, and in the same year, 273, he put an end to the Empire of Western Europe. Probus, who followed him, drove the Alamanni and Franks out of seventy towns which they had captured, while Probus's successor, Carus, pushed the Sassanians, who ruled over a vast empire covering the whole of modern Arabia and Pakistan, back beyond Ctesiphon, in Iraq.

The disasters which had overtaken Rome during the last century and more, for one reason or another did not affect the Eastern provinces, which did not share in the decline and fall of the Western. One reason was that they suffered fewer invasions, and as a result they had little difficulty in maintaining their trade. Damage in the west became much more severe as the insecurity became permanent.

To support their efforts to stop the rot, the Emperors imposed increasingly heavy taxes, which they insisted should be paid in pure coin or bullion, and at the same time they depreciated the value of the silver currency. This policy of desperation was bound to have disastrous results in the long run, and in the middle of the third century, a total lack of confidence in the monetary policy caused the whole economic system to collapse. This brought about widespread poverty and misery.

And in their misery men began to look for comfort in religion. Christianity, with its gospel of kindliness, its sympathy for the poor and for women, was particularly attractive, and by degrees it drew ahead of other religions. So numerous did the Christians become and so widespread their communities, that when an Emperor had need to distract the attention of the people from their miseries he organized persecutions of the Christians.

By the time Carus died in 284, the impossible had been achieved, and in form at least the Empire may be said to have been reunited. As this was what the last four Emperors had fought for, it may



appear a little strange to find Diocletian, who, after Augustus, was the greatest administrative genius in the history of the Empire, should have decided that it was too large a unit to be governed effectively from one centre; though it must be said that by the new administrative arrangements he made, he also hoped to secure the succession and obviate the bloody struggles which had so marked the election of a new Emperor in the past.

The Empire was divided into two major parts, the Eastern provinces forming the Empire of the East, and the Western the Empire of the West, and over each part an Emperor, co-equal with his colleague, ruled. These two major divisions were then subdivided each into two, and over one part a Caesar governed. The Caesar was to succeed his Emperor when the latter died. The arrangement fell down, however, when Diocletian abdicated in 305, and Constantine, after some years of struggle with his colleague in the East, Licinius, seized the power.

Constantine's rule brought to the Empire one of those upsurges of renewed vitality to which we referred in our early paragraphs. Two measures of Constantine, in particular, heralded in a new era. In 312 he accepted Christianity, and accorded to Christians freedom of worship; while at the Council of Nicaea in 325 he made Christianity the chief religion of the Empire, and thus firmly established it in Europe.

Secondly, he realized that Rome was no longer central or capable of being easily defended from threats by the barbarians of the north, so he decided to convert the ancient city of Byzantium into the New Rome, which he renamed Constantinople. This move undermined the influence of Rome as the secular capital of the Empire, though later it was to acquire a new significance by becoming the headquarters of the Pope, the head of the Christian Church, which thus made it the spiritual capital of Christendom.

Constantine died in 337, and his three sons divided the Empire between them. Constantius became Emperor in the East, Constantine II Emperor of Illyria, and Constans Emperor of the West. A year after this partition Constans attacked and killed Constantine II and annexed his territories. This was the beginning of the renewal of the decline of the Western Empire, for the struggle for power started all over again.

The civil strife in the Empire tempted the Visigoths, Ostrogoths and Goths, together with the Huns, to turn their attention to the Empire. It began in 365 when Procopius raised a revolt in Constantinople against the Emperor of the East, Valens. His revolt was

only overthrown by the arrival of the Eastern Army from Syria. But he had called in the Goths to aid him, and Valens decided to cross the Danube on a punitive expedition. He drove the Gothic chief Anhanaric into the Transylvanian mountains and enforced peace.

Then came a cataclysm. The Huns began to move from the east of the Caspian Sea, and overthrew the Alans and the Ostrogoths; in 375 they defeated the Visigoths on the banks of the Dniester. This defeat resulted in the greater part of the tribe fleeing to the Danube and clamouring to be allowed to enter the Empire. Valens decided to grant their request on terms. It was a tremendous decision to allow so many former enemies to pass inside the Imperial defences, but there were empty territories which they could develop in Moesia, and, perhaps more important to Valens, they would provide welcome recruits for the army. Besides, they were largely Christians.

Provided they gave up their arms, they might come, Valens told them. But once they were across the Danube the arrangements broke down, for corrupt Imperial officials, in return for bribes, allowed them to keep their weapons.

It was inevitable that under these conditions a struggle should develop between the Visigoths and their hosts. War broke out, and they were joined by the Ostrogoths. Moesia and Thrace were attacked and laid waste and their population carried off as captives; but in the cities, the Roman troops held their own.

The enemy, however, was too strong to be overcome by the local forces, so Valens recalled an army from the eastern frontiers, and his nephew Gratian marched to his aid with his army from the West. Valens, who had reached Adrianople by the end of July, 378, decided most unwisely not to wait for Gratian to arrive, and on 9 August gave battle.

He was completely out-manoeuvred by the opposing armies led by Fritigern, the Visigoth leader; his cavalry were outmatched by the Ostrogoth cavalry, and his infantry mishandled. His defeat was inevitable, and he fell with two-thirds of his army.

This catastrophe was a major one, for paradoxically it marked not the fall of the Empire in the East, but of that in the West. For the Goths, now inside the Empire, turned their attention westwards, while the Eastern Empire continued to flourish until the middle of the fifteenth century, when the Byzantine Empire, as it later came to be known, collapsed with the capture of its capital, Constantinople, by the Turks in 1453.

Succeeding Western Emperors tried desperately to remedy the catastrophe, and though some may be said to have succeeded in

part, they could never retrieve the former power. For the next hundred years the Empire crumbled inexorably away as the northern people gradually took possession of it. The Goths overran Italy and Gaul; the Franks and Alamanni seized the Rhinelands; Vandals and Germans established themselves in Spain; the Vandals in North Africa.

The definitive end came when the young boy-emperor Romulus Augustulus, elected in 475, was captured in the following year at Ravenna, by King Odovacar, a German military leader, who thereafter became King of Italy. By an ironic fate, the last Emperor of the once mighty Roman Empire in the West bore the same name as the founder of the city, the people and the nation from which that Empire had sprung.

## *The Founding of Islam*

### *A Dominant Factor in the Development of the Middle and Near East*

SOME SIX hundred years after the death of Jesus of Nazareth, the founder of Christianity, the people of Syria, Egypt and Ethiopia all professed His faith, while in the Arabian peninsula communities of Christians existed in the Yemen and on the borders of Persia—where the very ancient religion of Zoroastrianism, older than Buddhism by a couple of centuries, was still professed—and settlements of Jews were to be found here and there outside Palestine.

In A.D. 610 a new prophet began to preach in Mecca, an important centre on the trade route between Syria and South Arabia, and the focal point of a people so steeped in barbarism and idolatry that the city contained a temple in which were kept 365 gods. The teaching of the new prophet was summed up in the name which he gave to his religion, Islam, which means submission to God and His Divine Will, and in two short sentences which every new convert was required to pronounce publicly: "I bear witness that there is no God but Allah and that Mohammed is the Messenger of God."

Mohammed had been born between A.D. 569 and 571, to Abdullah and his wife Aminah, of the Arab tribe of Koreish. He was a posthumous child, and when he was only six years old his mother also died. His grandfather, 'Abd al-Mottalib, then brought him up, and when he died in his turn the boy was taken into the family of his uncle Abu Talib. One tradition has it that his grandfather 'Abd al-Mottalib was a wealthy merchant; on the other hand, evidence can be brought forward which suggests that though he was a leading citizen of Mecca he was by no means well-off.

As a boy Mohammed is said to have accompanied his uncle on trading journeys to both the north and the south with the two yearly caravans which were dispatched from Mecca each summer (to Syria) and each winter (to the Yemen). He may also have visited Egypt and Mesopotamia while still a young boy. His knowledge of the language of the Bedouins he is thought to have acquired in his wanderings as a caravan guide, while a young man.

This occupation he gave up when at the age of twenty-five he married a wealthy widow, Khadija, who was some fifteen years older than himself. He now became a partner in a Meccan green-grocer's shop.

In the Koran, the "Bible" of Islam, when referring to himself at this time he frequently uses the word *ummi*. In its primary sense *ummi* means "of the people, not high-born", though elsewhere in the Koran it is used to designate one who cannot read or write." The word can also mean *Meccan*, its derivation in this sense being *Umm al Qura*, the Mother of Villages.

It is known that by the time he was twenty-five he had acquired a reputation for practical wisdom well above the average, for many of his older fellow-citizens apparently sought his advice and help in financial and religious matters, a position not often accorded to one so young by his seniors. From this it is surmised that he could read and write, if not with any very great facility.

Unfortunately, those parts of the Koran which deal with the early period of Mohammed's life, and which should be reliable since the book was composed by the Prophet himself, are so full of cryptic allusions phrased in a language equally cryptic, that it is difficult to state with any certainty exactly when it was that Mohammed began to feel that he was being called upon to act as the mouthpiece of God. However, by his earliest biographer, Ibn Is-hak, who died in 768, the date of his Call, as it is known, is set in 610.

What exactly motivated him he never clearly explained himself. It would seem, however, that he was impressed by the effects of the paganism all around him, and being aware from his travels both to the north and to the south of the influence of Christianity there, he aspired to restore the ancient "religion of Abraham".

Why he chose the "religion of Abraham" has been the subject of much scholarly speculation, since before his time this religion was not widely known among the inhabitants of Mecca. It has been suggested, *per contra*, that it had been generally practised in the city though so far back in time that everything relating to it had been forgotten. The theory is based on a nice point; one of the features of the religion "of Abraham" was circumcision, and circumcision was observed, though with technical differences from the Jewish method, by the tribes of Mecca, but not by any other tribes of the Arabian peninsula, except in the Jewish communities.

It is thought that the religious confusion which the recognition

of scores of gods created impressed itself upon Mohammed and that he saw that a monotheistic religion would remove the confusion. In his search for such a system, influenced no doubt by what he had learned of Jewish traditions, and by the Jewish practice of circumcision and the observance of the custom by the Meccan tribes, he decided to revive and restore the ancient religion.

The revelation that he was to be the mouthpiece of God reputedly came to him while he was in a religious retreat on Mount Hira, near Mecca. There, one day, while he was meditating, the Archangel Gabriel appeared to him and not only announced to him his mission, but related the first pronouncements on which the restored religion was to be based.

From now on, and especially during the three following years, Mohammed claimed that he received Divine guidance either through the intervention of the Archangel Gabriel, or in direct contact with God. In the Koran he says that the first revelations were handed to him on rolls or parchments, a method soon replaced by oral communications made to him while he was in a trance. He did in fact self-induce these trances by enveloping himself in blankets which produced copious sweating. To begin with, he was enjoined to carry his mission only to his nearest relatives. After a time, however, the scope of his mission was widened, though he was still required to perform it in the greatest secrecy.

This phase ended in 616, when, it is thought, he began to preach in public in response to the pleading of his most ardent followers. His sermons were mostly violent attacks on the local Meccan deities and expositions of the true religion.

Gradually his following increased, being drawn chiefly from the poorer strata of Meccans. A number of prominent men, however, were also attracted to him, though there were others who saw that if he were allowed to continue winning adherents he would soon become dictator of Mecca. When counter-arguments failed to have any effect on his success, these men instigated a persecution of his less influential followers, a number of whom sought safety in Ethiopia.

Hoping to win the support of the Ethiopian authorities through these exiles, Mohammed sent his cousin Ja'far to them, charged with explaining what the new religion was about. Through a complete misunderstanding of the situation—apparently the Ethiopians gained the impression that the refugees were persecuted Christians—Mohammed achieved his object.

Seeing this, his Meccan opponents set siege to that quarter of the city in which he and his followers were living, intending to

starve them either into submission or to death. For a time the siege was withstood, but soon some of the besieged began to falter. Since the besiegers made it a condition of their withdrawal that Mohammed should retract all he had said about the Meccan deities, seeing no other way out of the situation, Mohammed complied.

This defeat did a great deal of harm to his mission, but just as total failure seemed imminent, help came from an unexpected quarter. The city of Medina had for a long time been troubled by a feud between its two Arab tribes, the Aus and the Khazraj. They had heard of the teachings of Mohammed, and now, as a last resort, they invited him to come to keep the peace between them.

Since the Meccan authorities would have taken steps to prevent Mohammed from thus becoming the actual dictator of the important rival city, his acceptance of the offer was kept a strict secret. In order not to attract the attention of the Meccans his followers began to slip away to Medina in small groups, until only Mohammed, his friend Abu Bekr and his cousin Ali were left in the city.

On 16 July, 622, Mohammed and Abu Bekr made their escape, and were followed shortly afterwards by Ali. The Mohammedan era thereafter was proclaimed to begin from this date.

For the next eight years, Mohammed and his followers made war on the surrounding Arab tribes. He had hoped for the conversion of the Jewish tribes of Medina, but when they rebelled against him, he destroyed one and expelled the other. Gradually he extended his territory and his power until in 630 he re-entered Mecca, which he had left as a fugitive, as conqueror. Two years later he died, but by this time he was master of all Arabia.

The public life of Mohammed falls into two halves which are so distinct that he seems to be in each a different person. In Medina he was a political ruler. Though his goal—the conversion of Arabia—remained the same, the end now justified the means. The conversion of chiefs he bought by presents of cattle. The loyalty of the most powerful of the converts he secured by marriage either of himself or his relatives or chief adherents. When an occasion arose which seemed to call for special solution, he produced a new “revelation” to meet it. Some authorities even contend that assassination and murder in cold blood were considered legitimate in removing the most obstinate opposition.

In Mecca, both before and after the Flight, he was a prophet like one of the prophets of Israel. His main and only aim in this rôle was to convert the people from their idolatry. Those parts of the Koran—he began to compose it in 610, and continued to add to it until

his death twenty-two years later—which belong to the period before the Flight, seek to establish the unity of God in the understanding of his followers, and by their preaching against the use of force—which Mohammed reinforced by his own patience under persecution—display, at least on the surface, the Christian qualities.

It is widely held that the secret of Mohammed's success lay in his courtesy and polished manners. He could be all things to all men, and he fought them with their own weapons. In his personal behaviour he never swerved from the severe simplicity of the Arab life. The chief among equals, he shared all the hardships and dangers of his followers.

The follower of the religion of Islam is called a Moslem, that is, "One who submits to God". In the Koran, interwoven with descriptions of the Prophet's experiences and his revelations, are set out the articles of the Moslem's faith.

He must believe in God, the Last Day, the Angels, in the books revealed by God, and in all the prophets, of whom Mohammed is the last. Among these prophets are Moses and the prophets of the Old Testament, and Jesus. He must believe that God rules the universe by an unchangeable law, and he must accept the finality of death to be followed by a life to come in which everyone will be rewarded according to how he has behaved on earth.

In addition to these articles of faith, the Moslem is required to observe the Pillars of Islam—prayer, the giving of alms and the Pilgrimage to Mecca.

A Moslem is required to pray five times a day. The prayers are of different length, in set form, and should preferably be said in Arabic, though other languages may be used. Before praying, the hands, mouth, nose, face, neck, forearms, head and feet of the worshipper must be washed three times.

The times for prayer are just before dawn, when it is beginning to get light; at noon; when the sun is halfway down the sky towards setting; just after sunset; and one and a half to two hours after sunset. The faithful are called to prayer by the Muezzin. Each prayer consists of two parts, one recited in unison with other worshippers—if any are present—the other silently. The prayers are, in fact, recitations from the Fatihah or opening chapter of the Koran and from other portions of the book, and are accompanied by certain ritual movements; they conclude with a greeting to right and left.

Not only is the Moslem required to practise charity in the broad sense of doing good to his fellow-men, but he is required to give one-fortieth of his capital every year to some charitable purpose.



For one month in the year, all Muslims must fast from two hours before sunrise till sunset, during which time no food or drink must be allowed to pass their lips. The month set aside for this is the ninth month of the Moslem year, Ramadan. Since the Moslem calendar is a lunar calendar, Ramadan falls ten days earlier each year. Besides fasting, extra devotions are prescribed.

The Moslem Sabbath is Friday. On this day they assemble in their mosques, hear a sermon from their imam, and join him in prayers. Women are not permitted to enter the mosques.

The last Pillar of Islam is the Pilgrimage to Mecca. This pilgrimage had become an annual custom many years before the appearance of Mohammed. The Arabs believed that they were sprung from Ishmael, the son of Abraham, and that Mecca was the site of Jehovah's request that the patriarch should sacrifice the first living thing on which his eyes alighted. The Jewish tradition has it that this was Abraham's son Isaac, the Arab that it was Ishmael. In thanksgiving for his release from this promise, Abraham was believed to have built a mosque in Mecca. Islam took over this belief, and all Moslems are duty bound to make the pilgrimage at least once in their lifetime, if they can afford it.

The pilgrimage takes place during a designated month each year. Arrived at Mecca, the pilgrim must undertake to perform a certain ritual. In the courtyard of the great mosque—towards which all Moslems must turn, no matter where they may be in the world, each time they pray—is a black stone, believed to be the last surviving relic of Abraham's mosque, contained in a shrine called the Ka'aba. The pilgrim must walk round the Ka'aba three times, kiss the black stone and afterwards listen to a sermon preached on Mount Ararat.

Most pilgrims having completed the rituals at Mecca travel the 240 miles northwards to Medina, to visit the tomb of Mohammed.

As for the regulation of his daily life, the Moslem is forbidden by the Koran to eat the flesh of pigs or of any animal which has not been slaughtered in the name of God. Gambling and the lending of money on usury are also prohibited, and the drinking of intoxicants is discouraged. All men who can are required to marry, and each man is allowed to have four wives providing he can afford to treat them all equally. Divorce is permitted, and the process is extremely simple.

On the death of Mohammed, some of the Arab tribes attempted to return to their old ways, but his successor to the Caliphate, his great friend Abu Bekr, took energetic action against them, and turned the unbounded energies of the Arabs into other channels.

Within ten years they had subdued Persia, Syria and Egypt and forcibly converted their peoples to Islam. Within a hundred years their empire extended from Spain to central Asia.

In the mid-thirteenth century, Islam went into a decline from which it did not recover until the latter part of the nineteenth century. But Islam has always been a missionary religion, and it found great response in India, Africa and in parts of Asia. Though actual figures cannot be given, Moslem authorities put the number of adherents at the present time at between three hundred and fifty and four hundred millions, making it second numerically, after Christianity, of the world's great religions.

The emergence of the Prophet and the great success he achieved in so comparatively short a time was a dominant factor in shaping not only the history of the Middle and Near East, but of the Mediterranean areas of Europe. The Moslem Moors, who ruled the greater part of Spain for more than six hundred years, had a culture of their own, the influence of which on the arts and on letters was not confined to that country. Further, it can be said that by delaying the natural development of Spain as a great power until such time as the Tudors were sitting on the throne of England, the Moors had a hand in shaping the emergence of the New World. It is doubtful whether any of these developments would, or could, have taken place but for the great welding powers of the religion which not only made it possible for kindred but warring races to forget their differences, but for them to combine together to exert an influence on the history of the world.

# *The Coronation of Charlemagne the Great*

## *The Inauguration of Modern European Civilization*

FROM TIME to time there appears on the world's stage a great ruler who far outshines the greatest of many ages. Alexander the Great was one of them, Genghis Khan another, Napoleon yet another. They are a small and select band; to them belongs Charlemagne the Great.

In the third century A.D. there was a group of tribes of Teutonic origin, called the Franks, living in what is now North-west Germany and the Netherlands. By the fourth century, or a little later, they were divided into two main branches: the Salian Franks who lived around the estuary of the Rhine, and the Riparian Franks higher up the river. They were first the enemies and then the vassals of Rome, and the decay of the Roman Empire gave them their day.

The man who made use of that day was Clovis, the descendant of a certain Clodio, who had led the Salian Franks into what is now France and established his capital in Tournai. Thirty years before he became king his tribe had sent warriors to join the vast horde that defeated the Huns.

Clovis united many of the Salian Franks under his rule, and conquered much of Gaul. He brought the Riparian Franks, who had spread up the Rhine as far as Alsace, under his authority, and when their king was murdered they recognized him as their king.

Clovis was baptized a Christian, and nominally the Franks ceased to be pagans. His sons continued his career of conquest, and soon Frankland was an extensive area lying on both sides of the Rhine. Like Anglo-Saxon England, it was divided into more or less independent kingdoms, but in spite of civil wars there was a certain brotherhood between them.

The union of these Frankish tribes under Clovis and his successors formed the great Frankish realm which soon was to influence so greatly the history of Europe. It was nearing the peak of its greatness when on the death of his father, Pepin the Short, in 768, Charlemagne shared the rule with his brother Carloman, and when Carloman died three years later, became sole ruler.

This division which Pepin instituted was aimed at allotting the two brothers separate spheres of influence. This, however, did not prevent the personal rivalry between them, which their father had foreseen, from coming into play, and only the conciliatory efforts of their mother, Queen Bertrada, warded off an outbreak of hostilities.

This state of affairs was unfortunate, for it threatened to undo all that the great work of Pepin had achieved for the Franks—no less than the secular headship of the Christian West, the spiritual headship of which was vested in the Pope.

At this point in time, Italian politics were in a greater state of embroilment than they had ever been before. The death of King Aistulf of Italy in 756 had been followed by a disputed succession, which was finally settled when Desiderius, Duke of Tuscany, was elected king. Desiderius's policy was to avoid attracting the intervention of Pepin in the affairs of the Italian kingdom and its relations with the Papacy, at the same time that he cut the Papacy off from Frankish protection. He achieved a fair measure of success by the time that Carloman died and Charlemagne had become sole ruler of the Franks.

On the death of her husband, Carloman's widow had fled with her disinherited children to Lombardy, and this event caused Desiderius to attempt an open act of opposition to Charlemagne. He brought considerable pressure on the Pope to crown Carloman's children, which, in effect, was tantamount to proclaiming that Charlemagne was the usurper of Carloman's crown.

Successive Popes had tried to resist the "protection" which Desiderius had energetically attempted to force upon them. They had been too weak to resist him altogether, but the Pope who had recently ascended the throne of St Peter was made of a very different mettle. Adrian I threatened to excommunicate Desiderius if he did not desist, and called upon Charlemagne to come with an army to his assistance.

It is quite clear that Desiderius had miscalculated Charlemagne's strength and his own weakness, and when the Frankish armies arrived in his territories and besieged him in Pavia, after only a few months he surrendered and was deported to Francia.

In the meantime Charlemagne had journeyed to Rome, and there he made an arrangement with the Pope by which the latter received the territories of Tuscany, Spoleto and Benevento, while he declared himself to be "King of the Franks and Lombards and Patrician of the Romans". This meant that Italy was to be a part of the

Frankish realm, but a special part, for in his capacity of Patrician of the Romans, Charlemagne issued orders to the Pope and supervised the administration of all the Italian territories as far south as Rome. Thus the link which had formerly existed between Italy and the Byzantine Empire was broken.

Adrian and Charlemagne were in full accord in all this, and in spite of periodical contradictions and recriminations, the arrangement worked well.

It had been Charlemagne's aim to rule all Italy, but this he never achieved. The Empire of the East maintained its hold over southern Italy and Sicily.

Though the conquest of Italy had been an important part of Charlemagne's aims, it did not represent his most cherished wish. This was the conquest of the Saxons, the last pagan and independent tribe of inner Germany. Out of a reign of forty years he devoted thirty-two to achieving the subjugation of the Saxons, and while he was striving always to this end he was engaged in a series of campaigns and conquests elsewhere.

Motivated by a strange mixture of political insight, insatiable ambition and a sincere desire to protect and extend Christendom and civilization, he brought the whole of what is now France under his rule, made the Danes respect his arms, and forced the Bavarians and the Avars, farther to the east, to recognize him as their overlord. He also crossed the Pyrenees into Spain and pushed back the Moors behind the Ebro.

The measure of his energy can be taken when it is learned that while he was conducting these warlike activities, he personally administered his vast realm which stretched from the Elbe to beyond the Pyrenees and from the North Sea to the borders of Benevento, south of Rome. The Pope, even in ecclesiastical matters, as well as secular, bowed to his commands when their views in these matters conflicted.

But in his rôle as the most powerful ruler in Europe, Charlemagne was bound to find himself in conflict with the Empire of the East, and the Empire in the East still had a tremendous influence on men's minds, even if its physical power was of little or no account.

The tradition of the old Roman Empire was still strong in the memory of the people and particularly among the educated classes. The law and daily customs all recalled it; men read Virgil as well as St Augustine, and since the coming of Christianity, Rome, now represented in Constantinople, had always been the accepted protector of Christendom. In the eyes of the Emperor in the East, the

Franks and their ruler were upstarts, claiming—but nothing more—the status of supreme authority in the West. The time was fast approaching, however, when the Old Rome, the see of St Peter, was to put the seal on the upstart's claims and make the claims reality.

On Christmas Day, 795, Pope Adrian I died. The new Pope was Leo III, a Roman, and much disliked by the former Pope's family, though they were Roman also. Unlike Adrian, Leo was a weak man, and he showed his weakness at once by sending to Charlemagne the banner of Rome, promising fidelity, and requesting Frankish envoys to come to Rome to receive the homage of the Romans.

This infuriated his enemies, and on 25 April, 799, Leo was seized and tortured so brutally that he almost lost sight and speech, and was saved from death only by the arrival of Charlemagne's envoys. He took refuge with Charlemagne, and was escorted back to Rome under the Frankish king's protection. There his enemies were brought to trial and exiled to Francia, while Charlemagne, hoping to arrange a peaceful settlement between the papist and anti-papist factions, himself travelled to Rome.

There Leo performed an act which took Charlemagne entirely by surprise, and at the same time installed him as the protector of Christendom in form at least.

While Charlemagne was attending mass in St Peter's on Christmas Day, 800, and while he was kneeling in his place of honour near the altar, Leo suddenly placed a golden crown on his head, and the Roman nobles chanted the traditional recognition: "To Charlemagne, Augustus, crowned by God, the great peace-bringing Emperor of the Romans, life and victory." The Pope then performed the customary adoration due to the Emperors, and later crowned Charles the Younger, the eldest of Charlemagne's sons, king.

The Patrician of the Romans had become the Emperor; a new Roman Empire had been founded in the West.

Whatever Charlemagne felt in his secret heart, he expressed displeasure at what Leo had done, and he was indeed assailed by a number of genuine misgivings about his position. He was a traditionalist, and tradition had formulated several necessary stages in the making of an Emperor. He had to be elected by the Senate and acclaimed by the people, and if there was an Emperor in the East, the Emperor in the West had to be recognized by the Eastern Emperor as a co-ruler. The first two could be said to have been fulfilled by the acclamations in St Peter's, but the third, which was imperative, would probably never be accorded, and without it his

legal position as Emperor could be challenged. The legal authorities, however, argued that as a woman had usurped the Eastern throne, that throne was vacant.

This may have satisfied form, but it was not entirely satisfactory as a solution to a man who believed that authority must be based on the indisputable legality of processes and positions. It was to determine his right to the imperial throne in the West that for the rest of his life he sought an arrangement with the East. When, at the beginning, the successor of the Empress Irene refused his recognition, Charlemagne did not hesitate to attack Venice, the only dependency of Constantinople in North Italy. Following upon its submission to him in 805, he laid claim to Dalmatia, which also recognized the authority of the East. But within a short time a Greek fleet won back both Venice and Dalmatia for the East.

Charlemagne in reply sent his son Pepin to reconquer Venice. Its towns were sacked, its rulers, the Doges, were seized. Though the Byzantine fleet commanded the Adriatic, the East decided to negotiate, and Charlemagne offered to renounce his claims to Venice, Dalmatia and Istria in return for recognition. In 812, the Emperor Michael saluted him as co-ruler of the Empires of the East and West.

Unfortunately, Charlemagne was now seventy and approaching the end of his life. He died on 28 January, 814, in his palace at Aachen, and was buried in the great church nearby.

Possessing more creative genius than his father Pepin, he believed that his rôle as King and Emperor was not only to give his realms peace and good government, but to bring to new life the civilization which, together with religion and culture, had disappeared during the Dark Ages.

In every department of administration and war, in law and judgment he personally maintained control. He gathered round him a circle of learned men, the élite of scholars from every part of Europe. From Northumbria came Alcuin, an eminent teacher, from Orléans came Theodulf, the best writer of Latin verse of the day, from the Maingau came Einhard, the best prose writer, from Friuli, in northern Italy, came the grammarian Paul the Deacon, who wrote an outstanding history of his own people.

In the field of education, his first concern was to produce literate and, if possible, learned priests and monks. This, to the highest degree which his resources allowed, he succeeded in doing.

But the greatest effect of his efforts on the future came through his conquests and their very limits. In his Empire, the unity of the

#### THE CORONATION OF CHARLEMAGNE THE GREAT

Western church became an established and effective fact. His concept of the State ruled by God—which he took direct from St Augustine's *De Civitate Dei*—which he put into practice in Rome, provided the model for later papacies. Mediterranean Italy and Italy beyond the Alps were linked together. The union of all the Frankish tribes made possible the later withdrawal of the German-speaking Franks to form united Germany.

His reign, with all that he performed during it, with the laws he gave and the civilization which he brought to it, set the stage of Europe for all the great changes which the future was to bring.



## *Otto the Great Refounds the Holy Roman Empire*

### *Europe Unified at a Crucial Stage of Her History*

WHEN AUGUSTULUS ROMULUS, Emperor of the Roman Empire of the West, was deposed by Odovacar, in A.D. 475, and that Empire ceased to exist, the event did not affect the Roman Empire in the East, with its own Emperor and capital in Constantinople. From this date, the Emperors of the East assumed the titular headship of the West, but his authority was a mere figment of the imagination, for the people of the western provinces were effectively governed by their barbarian conquerors.

Besides claiming the secular headship of the Empire, the Emperors in the East also laid claim to being the spiritual heads of Christendom. But as the years passed, this too became a figment of the imagination, as the Bishops of Rome not only counter-claimed this privilege, but became the effective leaders of Christendom.

In the background to this struggle, the group of tribes called the Franks had been successfully making themselves masters of more and more territories in northern Europe and France and establishing what was in effect an empire for themselves. This process was spread over several centuries, but when, on the death of his brother in A.D. 771, Charlemagne became the sole ruler of this Empire, and in the course of the next few years had extended his authority over an even larger area, which included Italy to just south of Rome, and was thus the dominant ruler in Europe, the Pope, acting upon his personal initiative, placed the Imperial crown on the Frankish Emperor's head.

In doing this, the Pope declared Charlemagne to be Emperor of the Roman Empire, which, in the West, had been non-existent for just over three hundred years, declaring him to be heir to the Caesars. After initial misgivings as to the legality of the Pope's action, Charlemagne accepted this interpretation of his new rôle.

This new Roman Empire was, in extent, neither more nor less than Charlemagne's own Frankish Empire. The British Isles were not included in it, nor was Scandinavia, nor was the greater part of Spain. But it was a vast area, comprised of many independent-

minded tribes, welded into a whole by the personality and administrative genius of its Emperor; and it required a man of genius to hold it together. Indeed, it was only Charlemagne's genius which could supply any cohesion of its many parts, for it could not by any stretch of the imagination be regarded as a State, in the modern conception of that word. It was but a clumsy collection of many diffuse components, held together by its overlord.

Charlemagne was a member of what has become known as the Carolingian dynasty, which had been founded by his grandfather, Charles Martel, who had consolidated the rule first established over the Franks by his grandfather, Pepin, about A.D. 700. Now, the Carolingians had instituted a method of inheritance which the French were to continue until the disappearance of the feudal system in the thirteenth century. Under this system all the sons had equal rights to their father's possessions at his death.

On the death of his father, King Pepin, Charlemagne had shared his father's kingdom with his brother Carloman, succeeding only to the whole on Carloman's death. Charlemagne had three sons, so when he died his Empire would have to be divided into three parts, one of which was to be given to each son. Charlemagne decided the division: the Latinized west, which retained the Frankish name, and was ultimately shaped into the kingdom of France; the eastern, or definitely Germanic, section and some of the Slav peoples; and the central portion lying about the rivers Rhine and Rhône, and including the greater part of Italy, the southern part of which, however, still continued to be attached to the Roman Empire of the East.

Fraternal concord was rare in the barbaric kingdoms, but the Carolingians surpassed all save the Merovingians—who ruled over France for two hundred years from 500—in their lack of natural affection and elementary good faith. It was not that they lacked energy or ability, but they could not subdue their innate jealousy which led them constantly to conspire and war and murder to remove a brotherly rival and to further their personal aggrandizement. This weakness put them at the mercy of their vassals, for it was upon them that they had to rely for their actual power, and this was only forthcoming on the payment of bribes, to make which the royal estates had to be plundered.

Before their father died, Pepin, who had assumed the kingship of Italy in 781, died, and in the following year Charles, King of the central territories. This left only Louis the Pious, who had assumed the kingship of Aquitaine in 781. In 813, the year before he died,

Charlemagne appointed Louis co-Emperor with himself, hoping thereby to profit his successor by experience.

But the decline of the Carolingian Empire was inevitable unless the genius of the extraordinary Emperor were repeated in his successor, and Louis the Pious had not his outstanding qualities. Certainly he had several virtues. He was genuinely religious, he was virtuous and he was merciful. As a result of the first two, he was greatly under the influence of his clergy and his successive wives, Ermengarde and Judith, by whom he had four unruly sons.

He had neither the resolution nor the shrewd good sense to keep either his sons or his great nobles in order. However, in the early years of his reign he did not do too badly, though it has to be said that this was mainly due to the fact that the Empire had not yet lost the momentum imparted to it by his great predecessor.

He did much to remove many of the abuses which had inevitably grown up under Charlemagne, who in his later years had been a man of many interests, chiefly in education and in the promotion of a culture, which had diverted his attention from many of the aspects of government. In his relations with other powers he could also rely on the prestige of his father at least for some years, and as a result he was not threatened by disaster from without.

Perhaps the chief threat to his Imperial power came from the Popes, who were beginning to grow restive in the pursuit of autonomy, but for the time being they were kept in check.

The trouble for Louis may be said to have begun when in 817 he decided to allot his possessions to his successors on the Carolingian principles of inheritance. He made his eldest son Lothar co-Emperor with himself; he gave Aquitaine to Pepin and Bavaria to Louis, later called the German; while his nephew Bernard was to have the kingdom of Italy.

While the boys were too young to rule, all was well. But in 818 Bernard set the pattern of rebellion against the Emperor, who at once quelled it and punished Bernard by blinding him so cruelly that he died within a short time. For a decade the short-shrift which Bernard had received kept the others in check, but by 829, Louis, by his own unstable actions, had lost much of his personal authority. This encouraged his sons Pepin and Louis the German to ally themselves against him, and in the next year Lothar joined the rebellion, intent upon securing his father's abdication.

But Pepin and Louis preferred their father to their brother, and there followed a period of intrigue and civil war too complicated to be set out briefly. But the upshot of it all was that a disorder

was established where order was imperative if the Empire was not to be irremediably damaged.

Louis the Pious remained Emperor, after many vicissitudes, until his death in 840, but this event snapped the link which held the Empire together. Lothar, who had become reconciled to him shortly before his death, succeeded to the Imperial crown. But within three years Lothar's youngest brother, by his father's second wife, joined with Louis the German against him. Louis and Charles the Bald met Lothar in battle at Fontenoy on 25 June, 841, and inflicted on the Emperor an almost decisive defeat. The slaughter was immense, and the defeated side, the Carolingian homeland, lost for ever the leadership of Western Europe which it had held since Charles Martel. Lothar hung on until 843, and as both sides were by now worn out they decided to make peace. By the treaty which they drew up at Verdun the Empire of Charlemagne was broken up, for though Lothar retained the title of Emperor, he had no authority over his brothers. They were all equally kings of the Franks.

By the beginning of the tenth century the dynasty had also worn itself out, with the result that France became independent, while the supremacy of the Empire passed to an elected German king, who himself only bore the title after he had been crowned and anointed in Rome, for by this time the Popes had secured a great measure of temporal authority which was disguised as spiritual authority.

The first German king was Henry the Fowler, elected in 919 as King of the Saxons and Franconians. He brought to his kingdom his vast personal estates in Saxony, of which he was Duke, and perhaps even more important, the loyalty of the Saxons. These were firm foundations upon which to build the new kingdom.

Henry was a strong, practical and constructive statesman, and among his first acts was to gain the recognition of his fellow-dukes. By 925 he had established himself as the unquestioned chief and overlord of the ducal confederation; and by the time he died in 936, Saxony's pre-eminence was assured, so that there was no disputing the succession of his son Otto I.

Though not possessing the genius of Charlemagne, Otto was nevertheless a strong character endowed with a practical wisdom. He was determined to be the real ruler of Germany, and not just chief among the dukes. This meant that he must somehow unite Germany under his crown.

This he set out to do with a firmness born of a conviction of Germany's right to greatness, but it was a long and arduous task which he had set himself. The dukes objected to the new order

which he tried to introduce, and were led by his own two brothers, Thankmar and Henry. In the intermittent and confused rebellions which followed, one by one his chief antagonists were killed or died, and by a system of alliances Otto began to gain control over the duchies, to whom in time he appointed his own nominees.

This arrangement, however, was not entirely successful, for a rivalry sprang up between the dukes, who in turn were hated by their vassal counts and nobles. Soon the simmering discontent was brought into the open. Otto made skilful use of the rivalries, increased his power by shrewdly distributing his protection to weak, lesser rulers, and soon was in a position to take the first significant step towards achieving his ambition to restore the prestige and power of the old Roman Empire.

For nearly half a century Italy had been embroiled in petty squabbles and rivalries between weak kings and powerful vassal counts, and towards the middle of the tenth century the muddle had become so acute that two joint-kings had been elected to the Italian throne, which despite its two occupants, or perhaps because of it, was still extremely unstable. In Milan a large party of disaffected bishops and nobles gathered round a beautiful, wealthy woman of strong character, Adelaide, widow of the former king, Lothar II, whose dowry one of the co-kings, Berengar, had seized. Adelaide had fled to the castle of a friendly noble, Adalbert-Atto of Canossa, and let it be known that her rescuer could be certain of her hand as his reward.

Liudolf of Swabia and Henry of Bavaria both intervened, but without much success, and in 951 Otto himself undertook his first invasion of Italy in force. With the support of the disaffected nobles, he declared himself King of Italy, rescued Adelaide and married her. But the Prince and Senator of the Romans, Alberic, and his Pope refused to grant Otto an Imperial coronation in Rome. Before he could take steps to rectify this situation, Otto had to hurry back to Germany to put down the plots of his son Liudolf.

He returned in 961, when a war broke out between the Pope, John XII, and Berengar, king of the mutilated kingdom of Italy, for in return for assistance John offered to Otto the Imperial crown. With considerable ease, Otto overcame Berengar's kingdom, though the king had barricaded himself in his strong castle of St Leo and defied the invader.

Without waiting until he had brought Berengar to submission, on 2 February, 962, Otto was crowned Emperor in St Peter's, Rome. Then one of those strange events took place, the reasons for which

appear buried in the tortuous minds of those who bring them about. Almost immediately after crowning Otto, the Pope went over to the man from whom he had asked Otto to protect him. Otto decided to depose him, and in spite of the popular belief that no man could judge the Pope, John's excessively scandalous private life prevented him from having allies. Otto drove him from Rome, and drew from the Romans a novel promise not to elect a new Pope without his consent.

A council of obedient bishops deposed John, and appointed a layman, Leo VIII, in his place. Almost at once Berengar surrendered and was made a prisoner. The Romans, however, did not take to German rule, and when John suddenly died, discarding their promise they appointed a successor, having deposed Leo. Otto's reply was to starve the city into submission, capture the new Pope, Benedict V, and made the people reinstate Leo, who soon died, and was succeeded by John XIII. The Papal State was reduced by Otto to more or less nominal limits, while the young King of Lombardy was banished from his realm.

It was by these means and in this way that Otto re-created the Empire in the West, which he now called the Holy Roman Empire. For almost a thousand years, until 1806, a Holy Roman Emperor wore the Imperial crown, though for the last few centuries he did not wield Imperial power. It was when the then holder decided that a crown without power was ridiculous that a title which had become farcical was allowed to lapse. But in its heyday it brought to much of Europe a unity which it would otherwise not have had.

## *The Battle of Hastings*

### *The English Spirit is Born Out of Conquest*

AT CHRISTMAS, 1065, Edward the Confessor saw the consecration of the great Abbey Church at Westminster—he had moved his Court from Winchester to be near the building—and then died on 5 January, the eve of the Feast of Epiphany on which day he was buried. And, on the day of his burial, the Anglo-Saxon Chronicle recalls:

And Earl Harold was now consecrated King and he met little quiet in it as long as he ruled the realm.

The haste was certainly great. Edgar the Atheling, a direct descendant of Alfred the Great and a cousin of Edward the Confessor, was the legitimate heir to the throne by blood. But he was a minor and the Anglo-Saxon magnates considered that English sovereignty was too fragile a thing to have a young boy on the throne. Twenty-four years before, England had been a part of the Scandinavian empire and the house of Alfred had come into its own with Edward the Confessor only after the death of Hardicanute, the debauched son of the great ruler King Canute. So the English thegns decided that Harold Godwine, the most powerful noble of the south of England, the worthy son of a great father, who had married the Confessor's sister Edith, should succeed at once and without debate. The Anglo-Saxon lords were not as a rule very united and during Edward's reign there had been much strife. Harold, however, had played his hand with skill and, just before Edward's death, had made allies of the great northern thegns, Edwin and Morcar, by supporting them against his own brother Tosti in a quarrel about lands. Tosti had fled the country and indeed in 1066 was a minor danger to the peace of England, being about to return with a force of Flemish mercenaries and fight for his rights.

The great double danger came from Scandinavia and Normandy. The threat from King Harald Hardrada of Norway was not absolutely certain in the early days of 1066 and the more imminent danger was that from William Duke of Normandy. William's claim

to the English crown, but for the fact that he was himself a bastard, was better than Harold's. Edward the Confessor had been the son of the sister of William's father, Duke Robert. William was the more feared in that the weak Edward the Confessor, though accepting Harold as a sort of under-king in the last year of his life, had secretly promised the crown to William and favoured the entry into the kingdom of Normans. There had been a Norman Archbishop of Canterbury. There were many Norman monasteries and, on the Welsh marches, a Norman Baron, Earl Ralph, had even been given lands.

To King Harold, often known as Harold of the Fair Hair, came, a few days after his accession, a messenger from Duke William to remind him of his promise to accept William as King of England. Harold, when at sea, had once been driven on to the French coast and delivered, according to the Bayeux Tapestry which tells the story of the Norman Conquest, by a small piratical baron to the Duke of Normandy. William had treated Harold with honour and kindness. Harold stayed in Normandy to take part in several military expeditions with Duke William, and was even made a knight at William's hands.

William succeeded in persuading his guest to support his claims to the throne of England and, in a great public ceremony at Bayeux in the presence of many Barons and Bishops, made Harold swear a solemn oath to do so. According to English sources, Harold swore with his hand on a missal and, when the missal was removed, the chest on which it had been standing was seen to contain a collection of bones of saints and other sacred relics; according to the Bayeux Tapestry, there was no trickery and the relics had been there for all to see. The question of the oath was important in those days. Harold himself disregarded its binding quality but, before the Battle of Hastings, one of Harold's brothers suggested that Harold himself, on account of this oath, should not fight in the battle.

Harold at once took steps to make himself popular in England. Always a good administrator, a chronicler, Florence of Worcester, recounts that: "He began to abolish unjust laws to make good ones, to patronize Churches and Monasteries and to make himself pious, humble and affable to all good men."

Early in the summer, he was forced to raise an army and equip ships to drive off Tosti from the south coast. Tosti sailed north and landed at Lindsey in Lincolnshire where he was driven off by the northern thegns Edwin and Morcar. After that he sailed for Scotland. Harold remained on the south coast for he knew already that



hundreds of ships were being prepared in the ports of Normandy for invasion. However, in September Harold heard with surprise and dismay the news that King Harald Hardrada, joined by his own brother Tosti, had landed in Yorkshire with a fleet of two hundred warships and three hundred transports and, near York, had routed an English army led by Edwin and Morcar. Harold made a forced march northwards and, in a very bloody battle at Stamford Bridge, routed the Norwegians, both Harald and Tosti being slain.

When he was celebrating his victory at York, four days after Stamford Bridge, Harold learnt that the Normans had landed in force at Pevensey. His great chance of disputing the Norman landing was now gone. He hurried south, gathering what new forces he could, and set up his standard on a high ridge at Senlac, near Hastings, where are now the ruins of Battle Abbey. Like the Duke of Wellington at Waterloo, he held a position with a forest behind it, where, if necessary, he could rally his men.

But Harold's act was a rash one and he fell into Duke William's trap in offering battle so quickly. William had purposefully waited on the Kent-Sussex coast, building two great wooden castles, and hoping the English would do just what they had done. What the Normans had to fear was a campaign of small battles fought as they advanced into England against numerically superior forces in which they would exhaust both their men and supplies without being able to replace them. For Harold's ships, which had been scattered in various ports when William had landed, could at any moment cut communication with Normandy.

William Duke of Normandy, the fruit of an illegitimate union of his father Robert with a tanner's daughter, was one of the outstanding geniuses of his time. He had had to fight for his succession and, all his life, had been constantly engaged in wars with neighbouring feudal lords, out of which he had emerged successfully. The Normans were Scandinavians who had settled in Normandy during the ninth and tenth centuries and had adopted Christianity and the French tongue. They were a warlike and cunning race. Both Duke Robert and William were great patrons of the Church and attracted to their kingdom scholars from Italy, of whom such as Anselm and Lanfranc were among the greatest in all Christendom.

The Church gave the Normans their administrators and so the Norman dukedom was at once bellicose, well organized and pre-eminently Christian. For the invasion of England the Normans attracted knights and adventurers from other parts of France who were anxious for lands and gain; these men also believed that they

were serving the cause of Christendom in sailing against a relatively barbarous country, ruled by a usurper king who had broken his oath. God, after contrary winds which had long held back their fleet, had at last given them a fair wind. When Duke William himself had stepped ashore in England, he had slipped and fallen forward on his hands. A cry of alarm had gone up throughout the host at this evil sign. But William cried in a loud voice: "See, my Lords, I have by the grace of God taken possession of England with both my hands."

By 13 October, Harold's army was drawn up in battle array on Senlac heights, each man close to the other, forming a dense phalanx of warriors armed with battle-axes, javelins, lances and pikes. The Anglo-Saxons always fought on foot, unlike the Norman knights who were mounted. And on that day Harold received another emissary from William whose army was now drawn up just below the ridge, proposing that he should give up the crown in return for lands north of the Humber and the hand of William's sister Adela in marriage. After this was refused, it was plain that battle would begin the next day. William's army passed the night in prayer, silence and repose; the Anglo-Saxons in jollity, drinking ale and wine from great horns around their camp fires.

The great battle which was to decide the fate of England began with the terrible sound of trumpets from both sides as the Norman host advanced slowly up the hill. For a long while there was no sound but the clash of weapons and the shrieking of wounded men. The advantage of high ground told against the invaders at first and after a while some Bretons and French foot soldiers broke in flight. The rumour spread that Duke William had been killed and a part of the Norman army was seized with panic as the English left their stockade and poured down the hill. But William rallied his men and the English pursuers were cut down easily by the more heavily armoured Norman knights.

The lesson was plain: the English must remain in close formation rooted to the ground. The battle continued until the afternoon when William ordered all his army to carry out a feigned retreat. This time a far greater part of Harold's troops left their hill, shouting that victory was theirs, and the lesson of slaughtering the more lightly armed English was repeated on a far greater scale. William returned to the assault of the diminished Anglo-Saxons still gathered round Harold, ordering his archers to fire from a distance into the air; it was with an arrow in his eye that King Harold was killed. Many other English leaders were now dead and by the evening the

Normans had captured the King's gold standard and were on top of Senlac ridge. It was the death of so many English nobles which prevented any rallying in the woods and made the victory decisive.

Indeed after this battle no other large Anglo-Saxon army was raised. William and his knights waited a few days in the neighbourhood of Dover and Hastings, largely to recover from a dysentery which afflicted many of them. At Christmas, 1066, William was crowned King of England in London. Though he had to face some revolts in the North and in East Anglia, where Hereward the Wake defied him, King William I, after Hastings, had never cause to doubt his success. He had won all England by a single battle.

The Norman Conquest was extremely thorough. The Anglo-Saxon thegns were gradually deprived of their lands in favour of Normans and Frenchmen. There came a huge immigration of foreigners, principally Normans and Angevins, into England. Norman castles built at first of wood to hold down for a moment the surrounding country and then of stone arose throughout the country. William was not only a warrior but a far-sighted ruler; it was of the greatest importance for the future of England that he never gave his knights huge estates in one place so that, as happened in France, vassals could easily become more powerful than the king.

Anglo-Saxon England had been scarcely administered at all by the King; now each land had its Lord, each Lord his Overlord, the pyramid culminating in the monarch. The great Domes-day Book enumerated the wealth of the country and made possible a system of taxes. And now the Church, which was the guardian of civilization, came into its own and everywhere as in France priests and monks on a much greater scale than in Anglo-Saxon England began the task of educating men. William of Malmesbury, who finished around 1125 a work on the Norman Conquest, wrote of the English before the Conquest that religion was very much decayed in spite of the efforts of Edward the Confessor. The English nobility, he said, were:

"Given up to luxury and wantonness did not go to Church in the early morning after the manner of Christians but merely in a casual manner. The common people left unprotected became a prey to the more powerful who amassed riches either by seizing the property of the poor or by selling their persons to foreigners. Nevertheless, it is the manner of those people to be more inclined to dissipation than to the accumulation of wealth. There was one custom repugnant to nature which they had adopted; namely to sell their female servants when pregnant by them after they had satisfied their lust, either to public

prostitution or to foreign slavery. Drinking in parties was a universal custom, in which occupation they passed entire days and nights. They consumed their whole fortune in mean and despicable houses, unlike the Normans and the French who in noble splendid mansions lived with frugality. The vices attended upon drunkenness followed in due course, and these, as is well known, enervate the human mind."

Of the Normans, William of Malmesbury writes that:

"They were at that time exceedingly particular in their dress and delicate in their food, but not to excess. They are a race inured to war and can hardly live without it, fierce in attacking their enemies, and when force fails, ready to use guile or to corrupt by bribery. As I have said they live with economy in large houses; they envy their equals; they wish to vie with their superiors; and they plunder their subjects though they protect them from others. They are faithful to their lords though slight offence gives them an excuse for treachery. They are the most polite of peoples; they consider strangers to merit the courtesy they extend to each other; and they intermarry with their subjects. After their coming to England, they revived the rule of religion which had grown lifeless."

It was by civil organization and by the spread of education through the Church that the Norman Conquest proved itself the triumph of a higher civilization over a lower. For a while even Anglo-Saxon English went underground and became the language of underlings and serfs; Norman-French and Latin was the tongue of the ruling class and the educated. But this was only for a comparatively short period. Under the great Angevin kings, Henry I and Henry II, the conquerors gradually came to think of themselves as English and the English sense of liberty and justice became something which both Barons and peasants understood, as did the peoples of the towns which the Norman and Angevin order protected and encouraged to grow.

The language which was to be that of Chaucer and Shakespeare came back, enriched, into its own. When in 1215 King John was forced to sign the Great Charter, England was already born out of the realm of Alfred the Great and William the Conqueror. Indeed the Battle of Hastings in 1066, if it resulted in the falling of the Anglo-Saxons under foreign domination, was in fact the beginning of England, the painful birth of the English spirit.

## *The Council of Clermont*

*Paradoxically, the Crusades Enlarge the Life and Culture of Western Europe*

IN A.D. 69, the Jews rose in revolt against the domination of the Roman Emperor Vespasian, who sent his son Titus to put down the uprising and to inflict such punishment upon the rebels that they would be dissuaded from becoming troublesome again for many years to come. Titus laid siege to Jerusalem, and after a long struggle, in September, A.D. 70, the great city surrendered. The punishment which Titus chose for the Jews was the sacking of their capital; but more terrible still, he ordered the destruction of the Temple, the most sacred place of their ancient religion.

But by this time there were other sacred places also in Jerusalem. They were the sacred places of a very new religion. They included a little hill called Calvary and a tomb. On Calvary the founder of the religion had been crucified, in the tomb his body had been laid and from it had disappeared three days later. When forty more days had passed, some of the followers of the teacher had watched him ascend into Heaven, and when yet another forty days had gone by, a number of these same men had gathered in an upper room in a house in Jerusalem, and there the holy spirit of their resurrected Master had come to them. In that moment the first Christian Church had come into existence, and James the Apostle had been appointed its first Bishop. Since then, through persecutions and other upheavals, there had always been a Church in Jerusalem, and whatever disaster might overtake the city there would always be one.

By degrees the Christian faith had spread throughout the Roman Empire. It had resisted the vicious attacks of many Emperors, until, almost a quarter of a millennium after the destruction of the Temple, the Emperor Constantine the Great in A.D. 312 had accepted Christianity himself, and thirteen years later had made it the official religion of his Empire.

Constantine's mother, Helena, who had been converted many years before her son, at once went to Jerusalem and there over the place of the Crucifixion and the Holy Sepulchre she had built a

great basilica. From this time Christian pilgrims began to make their way to the city to pray at the Holy Places.

The Emperor before Constantine had decided that the Empire was too large a unit for one man to govern satisfactorily and had divided it into two parts. All the territories west of the Adriatic had become known as the Empire of the West, and had been ruled by an Emperor nominally from Rome, though he usually lived either in Milan or Ravenna; while all the territories east of the Adriatic had become the Empire of the East, ruled by its own Emperor. Constantine had started out as the Emperor of the West, but when his colleague of the East had continued his persecution of the Christians he had made war on him, defeated him, and become the sole ruler of the united Empire. After his death, the Empire had once more become divided, and the Empire of the West had gone into a sharp decline; and with the defeat of the Emperor by the Goths at Adrianople in 375, had practically ceased to exist. The Empire of the East had continued to flourish, however, and the Emperor in Constantinople was by far the most powerful monarch in the known world, his closest rival being the Emperor of heathen Persia on his eastern frontier.

In 610 the Persians invaded the Empire of the East, and in 614, with the help of the Jewish community within the city, had captured Jerusalem. Sixty-five thousand Christians were massacred, and the thirty thousand survivors had been sold into slavery.

The Persians burned the Church of the Holy Sepulchre and carried off the True Cross as a trophy. In 630, after many years of fierce fighting, the Emperor Heraclius defeated them and compelled them to return the True Cross.

The war, however, had caused appalling devastation throughout the Empire from the Bosphorus to Mesopotamia, and Persia was equally weakened.

While this had been happening, in 622, Mohammed had begun to preach among the Arabs, and had founded Islam, which by the time of his death ten years later was the dominant religion in Arabia. Under Mohammed's successor, the Moslems set out to conquer the world, and they met with surprising success.

Both the Empire in the East and the Persians were too worn out to undertake another campaign, and as a result, in 638, the Moslem Caliph Omar captured Jerusalem. By little more than half a century later they had conquered the whole of the coastline of northern Africa, all of southern Spain, the Persian Empire and the lands to the east as far as India.



Soon after his conversion to Christianity as the official religion of the Roman Empire, Constantine moved the imperial capital to Byzantium, henceforth Constantinople. Before doing so he (according to the medieval legend of the "Donation of Constantine") invested Pope Sylvester with temporal and spiritual power in the West, as shown in this wall-painting in a Roman church.

*Right* Wearing the long mantle of the Franks and the royal crown and carrying in one hand the orb, the king shown in this bronze statuette in the Carnavalet Museum in Paris is generally taken to be that prime promoter of European civilization, Charles the Great, or Charlemagne. For more than thirty years he was king of the Franks before, in Rome on Christmas Day, A.D. 800, he was crowned by the Pope as the first of the Holy Roman Emperors.





The Battle of Hastings. An almost contemporary record of the battle fought on 14 October, 1066, that decided the fate of England, is afforded by the Bayeux Tapestry. This pictorial history, sewn on a band of linen about 230 feet long by 20 inches wide, was executed to the order of William the Conqueror's half-brother, Odo, Bishop of Bayeux, for his cathedral. It is divided into 72 scenes, most of them described in Latin inscriptions along the upper margin, and covers the whole story, from Harold's departure for Normandy on a visit to Duke William, to his death at Hastings and the flight of his troops. In the scenes given here (*above and below*) the Norman horsemen are shown closely engaged with the Saxon housecarls on foot.





They had reached the walls of Constantinople, also, but in the face of disaster the Eastern Empire had rallied, and the eastern frontier of Christendom was fixed in Asia Minor. Though the Caliph was now the most powerful ruler in the world, the Emperor in the East was still the strongest Christian ruler.

Through all these upheavals the Church in Jerusalem had survived. Mohammed had laid down that all conquered peoples were to be offered two alternatives—conversion to Islam or death. Exempted from this law—for that is what it amounted to—were the Jews, the Zoroastrians and the Christians; that is, the people who worshipped one God. But the favoured had to pay highly for their exemption in the way of heavy taxes and certain prohibitions. For example, they might not carry weapons or ride horses; they must refrain from attempting to convert Moslems and they might not intermarry with Moslem women.

On the other hand, the Christian Holy Places were left untouched and in their possession, though they were not allowed to build new churches. If any disputes arose among the Christians, their own priests were to deliver judgment, and if their congregations caused the Moslem authorities any trouble, the priests were held responsible and executed.

The Christians of Syria and Palestine still looked upon the Emperor in the East as the head of their Church, and as his power as a secular ruler was respected by the Caliph he was able to prevent unreasonable measures being imposed upon the Christians in Moslem territory. Pilgrims continued to visit Jerusalem, and were in fact welcomed for the revenue they brought into the country.

When the crowning of Charlemagne by the Pope in 800 created a new Empire in the West, the Emperor in the East objected strongly. To persuade him not to make war, Charlemagne formed an alliance with the great Caliph Haroun al-Raschid, who recognized him as the protector of the pilgrims to Jerusalem from the lands of his Empire.

By the middle of the tenth century, the single Caliphate had been replaced by a Caliph in Baghdad who held sway over Mesopotamia and the East, and a Caliph in Cairo who ruled over Palestine and Africa. In 1004, Hakim, the Caliph of Cairo, suddenly turned against the Christians and decided to annihilate them. He ordered the Church of the Holy Sepulchre to be destroyed, but when he shortly afterwards declared himself to be God, it was clear that he had become mad, and he was deposed. His successor permitted the Emperor in the East to rebuild the Church of the Holy Sepulchre and restore the other Holy Places which had also suffered.

By the middle of the eleventh century, the number of pilgrims had greatly increased as more and more of Europe accepted Christianity, and about this time a nomad tribe who lived in the southern steppes of Russia appeared in Asia Minor. These uncouth Turks had recently been converted to Islam, and though they were strong enough to overthrow the Caliph of Baghdad had they so desired, they were overawed by the superior culture they found in Mesopotamia, and instead preferred to become his subjects. This did not prevent them from making expeditions against the Empire of the East.

As time went by these Turkish raids became more and more serious, and eventually the Emperor Romanus Diogenes decided that he must carry the war against the Turkish Sultan. The two sides met in battle at Manzikert on the eastern frontier of the Empire, in August, 1071. The outcome was a disaster of the first order for the Empire; Romanus was taken prisoner and his armies scattered.

From this catastrophe the Empire never recovered. The regular army had been destroyed and every surviving officer of high rank claimed the imperial title. The chaos created by the struggles of the many claimants produced most suitable conditions for action by the Turks. Turkish bands entered Asia Minor and roamed the country unimpeded, burning and pillaging the richest part of the Empire. For a time the fortified cities held out, but as their garrisons were no longer recognizing the authority of Constantinople, where almost every day an Emperor rose and fell, all were eventually overcome.

Some of the pretenders hired Turkish troops to fight for them against their rivals. One of them sent his Turkish soldiers against Nicaea, and when they had taken it they decided to remain in possession of it themselves. Another Turkish leader captured Smyrna and began to build a fleet. In 1085, the Armenian governor of Antioch, one of the centres of the Empire, sold the city to the Turks, while other Turkish chieftains seized the fortresses of Cilicia.

The same process was taking place also in Syria, where every city was governed by an Arab or Turkish chief. All were in a state of war with each other. Jerusalem was being competently administered by the Egyptian Caliph, but pilgrims could no longer reach the Holy Places.

It was this lack of unity among the Turks which at last struck the Emperor Alexius of the East as a favourable factor for the Empire, one which, if he had the necessary troops and arms, could greatly

enhance his chances of success if he should go over to the offensive. But troops and arms he lacked, and for the first time for many many years the Emperor in the East looked to that other Empire in the West, now known as the Holy Roman Empire of the German Nation.

But while the Turks had been overrunning the East, the Holy Roman Empire had also been experiencing its own difficulties, which primarily sprang from two causes. Though a kind of hereditary principle had been introduced to determine the succession, the heir of the old Emperor could not ascend his throne until formally elected by the great nobles and magnates of the Empire; and these invariably refused their confirmation unless the Emperor-designate would agree to grant them a certain measure of independence. This, of course, weakened his own authority and power, so that instead of being the strong and powerful ruler the Empire should have made him, he had to rely on alliances with his leading subjects in order to achieve any authority at all. This almost inevitably led to a division among the nobles and magnates and a constant struggle for power, which automatically weakened the effectiveness of the Empire.

Secondly, no Emperor could call himself such until he had been crowned in person by the Pope in Rome. By this time the Popes had become powerful secular rulers as well as the spiritual heads of Christendom, and if a particular Pope did not approve of the successor, for one reason or another, he could effectively block his accession by refusing to crown him.

When this had happened on the succession of Henry IV, Henry had got over the difficulty by declaring the Pope deposed and the appointment of a Pope of his own choice. The reigning Pope, however, resisted this, with the result that not only were there to be two Popes for more than a hundred years, each claiming to be the true Pope, but the magnates, by taking sides with Emperor or Pope, were divided into two warring factions.

As each successor to the non-imperially appointed Pope assumed his papal office, he first excommunicated the Emperor. Usually, the successors to the deposed Pope were recognized as true Popes outside the Empire, and the Pope who was elected in 1092—Urban II—a vigorous and somewhat warlike man who was determined to take active steps to resolve the fantastic situation, with the aid of France, England and Spain, had embarked on an invasion of northern Italy, and achieved quite a notable success.

In the spring of 1095, he summoned a Council at Piacenza with

the principal object of passing sentence on Henry IV, and it was while the Council was sitting that there arrived ambassadors from the Emperor in the East with the suggestion that now was the time for an offensive to be launched against the Turks. Alexius explained that he was quite prepared to undertake this offensive himself, but he lacked the necessary troops, and particularly cavalry. Remembering the formidable reputation of the Norman knights in this rôle, he asked Urban II to proclaim to the Council that if the Norman knights would take service in the Eastern Imperial Army they would be fighting in the service of God.

The proposal appealed to Urban, and he promised to put it forward at the first favourable opportunity. This did not occur until some months later, when he was holding a Council at Clermont, in France. No important western king was present at this Council. Henry IV was the Pope's enemy; William Rufus of England was only a Christian when he believed himself to be dying; Philip of France was under papal displeasure for his treatment of his queen; and the Spanish rulers were busy fighting the Moors.

In a great speech, Urban put before the Council the proposal for a Holy War against the Turks, with the ultimate objective of liberating the Holy Places from their control. First he pointed out that the Turks constituted a danger to the West, for when they had all the East in their hands they would be bound to embark on a conquest of the West. But it was when he described the oppression of the Church in Jerusalem and the sufferings of the pilgrims to the Holy Places that he caught the enthusiasm of the Council, and when he sat down all the members and spectators present gave a great cry: "It is the will of God!"

The following day the bishops formulated the rules for the expedition. Volunteers would wear a cross of coloured cloth on their tunics, and from this they were to be known as *Crucesignati*, Crusaders. While the knights were crusading, the bishops would protect their property. They would take a vow to fight their way to Jerusalem; if they got there or were killed in the effort, all their sins would be forgiven them; if they turned back, they would be excommunicated. The volunteers were to collect in Constantinople, and must be ready to set out from there on the Feast of the Assumption, 15 August, 1096.

An expedition of this kind was something quite new, and the preparations for it required great effort, but when the appointed time came no fewer than thirty thousand knights and their followers gathered in Constantinople.

This first Crusade was a badly organized affair, and as a result the whole force was shattered by the Turks at Nicaea. This did not, however, dampen the enthusiasm for the Holy War, and in 1097 a better, well-organized army was assembled, again at Constantinople. It penetrated Asia Minor, captured Edessa and Antioch, which fell, after a long siege, in 1098; and laid siege to and stormed Jerusalem in 1099.

Godfrey de Bouillon became first King of Jerusalem, and the Latin Kingdom, or Kingdom of Jerusalem, was established from Jerusalem to Edessa. The crown was elective and the army of occupation virtually consisted of changing bands of warrior pilgrims. Prominent among the defenders were the half-monastic, half-military Orders of the Knights Hospitallers and Knights Templars.

In 1144 the Turks recaptured Edessa. This led, in the following year, to the Second Crusade, headed by Louis VII of France and the Emperor Conrad III. It was a disastrous failure.

In 1186 the Sultan Salah-ed-Din, a Seljuk Turk, who had gained supremacy over the Moslems of Egypt and Syria, inflicted a great defeat on the Christians at the Battle of Tiberias, and in 1187 captured Jerusalem. This roused western Europe to unite in the Third Crusade in 1189. Frederick Barbarossa led a great army into Asia Minor, but after his death his force disintegrated. The other Christian princes, notably Philip Augustus of France and Richard I of England, attacked Palestine by sea and captured the port of Acre. But the Crusade ended with a treaty in 1192 which secured nothing more than safe access to the Christian Holy Places by Christian pilgrims.

Between 1202 and 1270, four other Crusades were organized. None was in any sense an effort of united Christendom, and when, in 1270, Louis IX of France and Edward, Prince of Wales, shortly to become Edward I, decided that the conquest of Egypt and Palestine was not a practicable proposition and retired in 1272, thus closing the Seventh (and last) Crusade, nothing more substantial had been obtained than a ten-year truce.

Apart from what may be termed their romantic interest—the chivalry of the crusading knights, the sacred cause which genuinely inspired many of them and the magnificent panoply with which they went to war, all of which contrasted greatly with the barbarianism of the warriors of former times—and apart from their complete failure as an attempt to bring the East into subjection to the West, the Crusades have an importance in history.

They maintained contact between East and West when the East

more than the West was the seat of culture. Acquaintance with Eastern intellectual ideas enlarged the mental horizons of many Crusaders and assisted in preparing the way for the Renaissance. They introduced to Europe new foods, especially exotic fruits, new plants, clothing materials and tools, while the creation of the Latin Kingdom also opened up intercourse and commercial relations with people who were a permanent barrier between Europe and India and China.

Thus, though they failed in their primary objectives, they had an important if indirect bearing on the development of Europe over the next two or three centuries, through the influence they had on European culture.

## *The Introduction of the Jury System*

### *Henry II Bestows on Englishmen the Boon of Impartial Justice*

SINCE HIS only legitimate son had been drowned, Henry I, son of the Conqueror, had nominated as his successor his daughter Matilda, wife of Geoffrey Plantagenet, Count of Anjou. But when the old king died in 1135, the Great Council, deciding that a woman was unfitted to rule and calling out of abeyance the old English right of electing a king, offered the crown to Henry's nephew, Stephen of Blois, son of the Conqueror's daughter.

Of Stephen a contemporary chronicler wrote: "A mild man, soft and good, and did not justice. He began many things, but never finished them." He was certainly too easy-going to control the little-disciplined people who called him to be their king, and during the nineteen long years that he occupied the throne a period of anarchy existed in England never equalled in a thousand years of history.

Weakness in a monarch is quickly discerned, and there are always those ready to take advantage of it. In Stephen's case it was the Welsh and the Scots who marched into England, massacring and raping and despoiling the country, while the king made no move to stop them. Had it not been for the aged Thurstan, Archbishop of York, who called out the Yorkshire nobles, himself leading them into battle at Northallerton, where he defeated the invaders, no one can say what might have happened to the country.

Nor was Matilda, of genuine Norman stock, prepared to surrender her rights without a fight. In 1139 she landed in England with an army, and already dismayed by the effects of Stephen's weakness, many English barons flocked to her banner. For the next eight years England was racked by civil war.

During these eight years the anarchy and disorder increased. Many of the barons, seeing an opportunity for personal gain, sided first with Stephen and then with Matilda. Without the constraint of a strong hand, which for the past seventy years the kings of England had exercised through the royal council, many of the barons built themselves castles without licence, and from them sallied forth to wage private war upon their neighbours. Some even brought

foreign mercenaries over from Europe to fight their battles for them, and these foreigners made things even worse.

"They put men in prison for their gold and silver, they hung them up with their feet and smoked them with foul smoke. They put knotted strings round their heads and writhed them till they went into the brain. They put them into dungeons crawling with adders and snakes," wrote Richard of Hexham, an historian of the times.

And while men fought, the country went to ruin. No plough cut a single furrow; no crop was planted, no harvest gathered; and no man knew whether he still possessed his cattle or not.

Even those who were responsible for much of the crime that was committed eventually saw that if the state of affairs were allowed to continue little good would their ill-gotten gains do them, and by degrees a universal desire for a strong king's rule emerged among Englishmen and Norman barons and knights alike and the famous English genius for compromise began to work.

An agreement was reached by which Stephen was to rule until he died, and then was to be succeeded by Henry Plantagenet, Count of Anjou, Matilda's son. In 1153, Henry crossed to England and rallied his mother's supporters. Within six months he had completely transformed the scene, and when in the following year Stephen died and he was crowned at Westminster, every bell in England rang for joy.

Henry was just twenty-one. From his father he had inherited Anjou, Maine and Touraine, and in his mother's name had seized Normandy. By marriage to a woman twelve years older than himself, and the greatest heiress in Europe, the divorced queen of Louis of France, Eleanor of Aquitaine, he gained control of half France and doubled the extent of his domains. When he assumed the crown of England his writ ran from the northern boundaries of Northumbria to the Pyrenees.

Henry was a scholar and a champion at arms. An eloquent speaker, he delighted in learned conversation; he was never happier than when exchanging rude jokes with his soldiers round the camp fire. In utter contrast to Stephen, he had a will of steel, a grim determination to achieve his ambitions, and a fund of energy which disturbed all who came into contact with him. He had one overriding passion—to restore order and justice to England, and maintain order within his other realms.

He was no sooner on the throne than he set himself to this task. He ordered all the mercenaries to leave England, he ordered the



barons who had built unlicensed castles to pull them down, and he demanded the return of all Crown lands which had been filched during the troubled years.

When the earls whom his mother and Stephen had created thought to ignore him, he marched against them, and so frightened some of them that they obeyed at once as soon as he approached. This settled, he turned against the Welsh and Scots. The first he sent scuttling back to their marshes and mountains, the second he forced to return those parts of Northumbria they had seized and compelled them to come to Chester to do homage to him there.

In what seemed to be no time at all, the country was in good order once more. But Henry was not content to rest upon his laurels. He desired to leave the kingdom greater and stronger than it had ever been, and this meant reform, for he had no ambition to increase the extent of his domains.

To appreciate his achievements, it is necessary to consider briefly what the feudal system meant to England at this time.

Theoretically, the king owned all the land and was the fountain-head of all honour. He honoured those who were worthy of honour by granting them estates, which they held from him, again in theory, as tenants. In practice, however, once the king had made a grant of land to a man, whether he also bestowed a peerage or some lesser title or not, it was a grant in perpetuity, so that in fact the tenant really became the owner.

In the same way that the king granted land to his tenants-in-chief, as they were called, so they, in turn, made grants from their own estates. These lesser tenants were, however, considered to be tenants of the king as were the tenants-in-chief.

The king made a grant of land to a tenant-in-chief on the understanding that in return the tenant would swear him allegiance and fulfil certain conditions of service. According to the size of the grant, so were the services regulated. The first and most important of these conditions was to provide the king with men and money, if he needed the latter, with which to fight his enemies.

The lesser tenants held their estates on the same conditions and they made to their overlords the same promises of service. It was understood, however, that the first allegiance of every man was to the king. Should a dispute arise between the king and one of his tenants-in-chief, the lesser tenants' loyalty was to the king.

In addition to the exchange of land for services, the overlord, whether king or tenant, owed his tenants protection. There was, therefore, a basis of mutual obligation in all the relationships between

overlords and tenants, in whatever degree they might be; that is to say, whether they were king, earls, barons, knights or lords of an unennobled manor.

From this it will be seen that the ownership of land was a paramount, indeed *the* paramount, consideration. The more land a man owned, not only was he wealthier, he was more powerful. It was this that lay at the root of all struggles. There was a constant attempt by the majority to increase their holdings, for which they were prepared to fight, if not always on the battlefield, then in the feudal courts; and in the latter, the only means of determining ownership was trial-by-combat, when the two contenders fought one another, and the one who won the contest won the possession.

To preserve the stability of his realm at all, a king in such conditions had to be able to control his tenants-in-chief. Previous kings had been content to do this by threats of waging war against them. Henry, however, preferred to do so by other means. Any baron who infringed the royal rights quickly found himself required to pay a fine, or increased rents.

To keep an eye on the doings of his sheriffs, whose duty it was in the first place to make the levies and collect the dues on his behalf, Henry sent out the high officials of the Exchequer, known as the Exchequer barons, on circuits. That is to say, each Exchequer baron was given a certain area, and he sat in the court of each sheriff in that area in turn.

At first the main function of these Exchequer barons was merely to keep watch to see that the king received his proper financial dues, but as time passed he empowered them also to hear certain pleas which would normally have been made direct to him.

For many centuries in England it had been regarded as the king's duty to see that justice was done and every freeman in the land had the right to appeal to the king if he believed himself to be wronged. To begin with such pleas had to be presented to the king in person, but after a time matters of lesser importance could be taken to the sheriff, who was empowered to make a decision in the king's name.

Under this system, the criminal jurisdiction of the Crown was limited to contempt of the king's person, in other words, treason, and breaches of the king's peace committed on the royal estates and the highways. For dealing with all other types of crime the sheriff was responsible.

Now Henry changed this still further, and by transferring the sheriff's chief judicial powers to the Exchequer barons on circuit he extended the criminal jurisdiction of the Crown to all crimes, though

he was not personally involved in reaching the verdict or pronouncing sentence.

Within a few years, further changes were made. Since the system was seen to work well, it was clear that it would be advantageous to have trained and experienced officials to dispense the criminal law in this way, and slowly there came into existence a body of trained impartial judges capable of meting out true justice.

Under the old system, where a man accused of a criminal act was tried by the local sheriff he could not always be sure of a fair and impartial hearing. Many sheriffs were open to bribery, and this meant that the man who could pay the most could be sure of the verdict, whether or not he was guilty. Henry's new judges, by having no local interests, were less open to corruption, and as they were constantly travelling about the country they were unlikely to develop such interests.

It then occurred to Henry and his judges that if these procedures could work well in criminal cases, they might be extended to a class of case which, while not criminal in the sense that it was murder, rape, forgery, arson, robbery or larceny, was perhaps even more common than any of them.

During the late civil wars, one of the commonest acts had been the habit of an overlord to seize land from a neighbour not so powerful as himself on some trumped-up excuse. The war at an end, the victim of such a "theft" had two courses open to him: he could either rally his own tenants and supporters and try to get the seized land back by force, or he could appeal in the overlord's court for the right to get it back by trial-by-combat. Since the overlord was in many cases the man who had seized the land, the victim could be sure that delays would be organized to prevent the trial-by-combat from ever being held, and such disputes might be carried over from one generation to the next.

Henry found that there were so many cases of this kind, that he devised a system of writs. A writ was a Royal Command which restored to a freeman lands which had been forcibly seized from him. The writ commanded the sheriff to order the overlord of any seized land to restore it at once to its rightful owner or appear before the King's Court to argue why he should not.

This kind of writ was called *praecipe*, and there were two other kinds: the writ *novel disseisin*, which ordered the sheriff to restore his lands to any freeholder who had been dispossessed pending trial and to summon "twelve free and lawful men of the neighbourhood to recognize and declare" before the king's judges who had the

rightful possession; and there was the writ *mort d'ancestor*, which protected a freeholder's heirs against all claims which could not be proved in the royal courts.

The effect of these writs was threefold. They protected a man's right to possession as distinct from his legal ownership; they made any freeholder who had a claim plead his claim in the king's court and not in the overlord's; and they replaced the barbaric trial-by-combat with the system of inquiry or recognition by "twelve free and lawful men of the neighbourhood".

These twelve men, soon called *jurymen*, were men who were experienced in questions of this kind and who had special knowledge of the circumstances of the claim. They were required to answer questions of common knowledge put to them under oath by the king's judges.

This, too, was soon seen to work well, and presently the system was extended to actions to determine legal ownership. A freeholder whose title to his land was challenged could claim, by Grand Assize, to have his claim tried in the king's court instead of his overlord's court. Here, too, twelve knights of the shire were required to declare in the presence of the king's judges under oath which of the two parties had the better title, either from their knowledge or in their opinion. Once their decision was made and declared, it was final.

Soon the system of jurymen was extended to criminal justice. For example, the assize judges of Clarendon were commanded "to inquire from twelve lawful men from every hundred and four from every township whether any of their neighbours is guilty of having committed a felony". Only those named by these jurors were brought to trial.

From this it was a short step to the system by which twelve men, ordinary men, having heard the facts of a case presented were required to determine whether the facts were true or not. Granted the safeguards of the law, there was no fairer way in which a man might be judged. Twelve ordinary men, without knowledge of the law, required to base their decisions on ordinary common sense were without doubt the most impartial judges of all.

The British have a reputation that is world-wide of being the most law-abiding nation on earth. For a nation to be law-abiding its people must have full confidence in the administration of justice. The jury system gave the British this confidence, and made British justice the envy of the world.

# Magna Carta

## *The Basis of Democratic Liberty*

"TAKE AWAY JUSTICE," proclaimed St Augustine, "and what are kingdoms but acts of robbery?"

It is fairly safe to say that had the saint been alive in England at the beginning of the thirteenth century he would have been assured of the truth of his pronouncement by every man in the country but one.

The Norman Conquest, a hundred and fifty years away in the past, had sunk into history, and though great developments in the realm of government had taken place in the intervening years (developments which by degrees had made justice available in theory to all but the most under-privileged), the last year of the old century had placed on the throne of England a man who, before the first decade of the new century had run its course, bade fair to undo all the good that had been done.

He was a tough, sallow, moody, energetic little man of five feet five inches. Born late in his parents' lives, he was spoilt by both in childhood; they quarrelled over him, but found common ground in their doting on their precocious child.

He lacked the two essential qualities of a good ruler—self-discipline and balance. Unable to control himself, he was equally unable to discipline others. Unpredictable and ever changing in mood, no one could be sure how he would act from one hour to the next, and most therefore shied away from him.

He suffered, too, from a tremendous chip on his shoulder. Before he was born, his father, not expecting to have yet another son, had divided up his not inconsiderable empire among his five older sons. There was nothing left for the sixth and youngest son, whom the father sometimes called *Jehan sans terre*—John Lackland.

The fact that, compared with his brothers, he possessed nothing, made him suspicious and greedy, and even after he attained the throne of England, John could not rid himself of the conviction that everyone was plotting to defraud him. He found it difficult to trust almost any man, and to compensate he seemed deliberately to make

opportunities for cheating all who came near him, and grabbing everything that came within his reach.

But for all these unpleasant traits of character, from early boyhood he displayed great charm. Far from being an asset this very charm proved to be one of his greatest liabilities, for neither his parents nor his generous elder brother, Richard I, could bring themselves to discipline him when he committed some of his worse lapses.

He was indeed a conglomeration of paradoxes. Suspicious, greedy, grasping, charming, genial, sensual, self-indulgent, open-handed, mean, the victim of mad rages which so contorted his body that while they lasted he was unrecognizable, he grew up completely without morals or any sense of responsibility. And yet there were times when he demonstrated that he possessed administrative abilities of the highest order, while his knowledge of the law made him one of the leading justiciars in the kingdom.

The reign of such a king could not avoid being fraught with troubles and difficulties, and almost from the start it became only too evident that the country was in for sad, disturbing and disturbed times.

Within three years of succeeding Richard in 1199, John had managed to lose two-thirds of his empire in France. By the end of three years more he had nothing left of his father's great overseas possessions but the Channel Islands, a portion of Poitou, and the province of Aquitaine which had come to him from his mother. And all because he made mistake after mistake in dealing with the wily and determined King Philip Augustus of France whose one ambition was to chase the English out of France and unite the whole country under his crown.

Having lost the war in France, John then chose to pick a quarrel with one of the most powerful men in Europe and one of the most able statesmen to sit in the Chair of St Peter, Pope Innocent III. It began with the election of a successor to his old tutor, Hubert Walter, Archbishop of Canterbury. Anticipating the nomination of a royal candidate, some young monks of Canterbury elected one of their own number, and sent him to Rome to seek the Pope's approval. In the meantime, the Chapter of Canterbury, frightened of incurring the terrible royal displeasure, elected John's nominee, the Bishop of Norwich.

The Pope, on being requested by the Chapter to grant his approval, refused to give it, and declared both elections void. He also directed the monks of Canterbury to send delegates to Rome with powers to nominate and elect a new candidate. The monks obeyed, and as

a result one of the greatest theologians of the day, Cardinal Stephen Langton, a Canon of York, then living in Rome, was elected Archbishop of Canterbury.

When news of the election reached him, John flew into one of his terrible rages. He sent his soldiers to Canterbury and drove the monks out of the kingdom. He would not accept as Archbishop a man of whom he knew nothing; but not only that, he claimed that one of his most sacred prerogatives had been taken from him. While he agreed that the Pope might refuse to approve a man whom he had nominated, the Pontiff had no right to require the monks of Canterbury to elect a candidate whom the Pope himself had put forward. He refused to allow Langton to take up his appointment.

For a year the Pope tried to argue with John, but at the end of that time, having made no progress, he excommunicated the king. The effect of this excommunication, which John himself appeared to ignore, was that nearly all the churches were closed, scarcely any services were held, and as a contemporary chronicler put it, "God and his angels slept."

For five years this state of affairs lasted, and one of its consequences was that John made enemies of his own barons. By his actions he lost the confidence of almost all the great nobles, and attracted the bitter hatred of many.

His attitude and his actions towards his barons sprang from two causes. First, he blamed the barons for his losing the war with France, accusing them of reluctance to come to his aid when he was in dire need. Second, he was determined to increase the already tremendous power of the Crown. To this end, he embarked upon a course of doing all he could to weaken the financial position of the nobility. He mulcted them of as much wealth as he dare—and he was greatly daring—by imposing taxes, fines and confiscations, under which he seized gold and silver, jewels and precious stuffs, which he intended to hoard against the day when he would once more join battle with the King of France.

His two chief weapons in this campaign of despoilment were the levy called scutage and what were called "aids" demanded from the tenants-in-chief. Scutage is derived from the Latin word for a shield, and it was used to describe the sum of money which Henry I had allowed his barons to pay instead of providing the king with soldiers. The money so raised was originally intended to pay mercenaries to fight the king's battles for him. Aids were requests made only under very special circumstances and John's predecessors had called for them only in times of great emergency.

But besides scutage and aids, John also imposed two levies on the capital value of all personal and movable goods owned not only by the barons but by the merchants and burgesses.

Nor was this the total of his fortune-grabbing activities. When any of his tenants died without heirs and the estates came into his custody, by special taxes he stripped them of almost all their value; and there were other equally outrageous and unlawful impositions.

To administer his tax-gathering he employed mercenary captains as sheriffs and gave them judicial powers to enable them to extort money by whatever means they could devise. False accusations were made and fines imposed, writs were sold at exorbitant rates, and without regard to the nature of an offence the most crushing money penalties were exacted.

If God and His angels slept, Justice was not only blind but had fallen into a deep trance. By the end of five years, not only had John amassed an immense fortune from the coffers of nobles and merchants, but had succeeded in denying justice to all. If a tax or a fine were imposed and the unfortunate man could not pay, he was cast into prison where he might be detained during the King's Pleasure; and if the king's or sheriff's displeasure alighted on any man, he might be cast into prison without trial, and there be kept without any opportunity to defend himself.

These attacks by the king on purses, liberty and lives intimidated those very men and women on whose loyalty his throne depended; and it is one of the strangest features of these times that the great barons allowed themselves to be so mistreated for so long. "There was not one who did not obey the rod of the king," an historian of the times tells us, but at the same time gives no clue as to why they suffered these royal assaults so passively.

There is little doubt, however, that the interdict under which the Pope had laid the king and country was in a large part responsible. It is difficult for us in an England of four hundred years of Protestant tradition to appreciate the reactions that being a spiritually outcast nation led by an outcast king could have on minds which placed so much store on the triumph of Christendom that lives and fortunes were joyfully hazarded and hardships so readily undertaken to protect the Holy Places a thousand miles away.

In those days rough, lusty licentious men felt a genuine need for the consolations of religion and a Church. Never before in the memory of man had men been deprived of these consolations, and the first effect was a kind of numbness which more and more sapped the moral strength. But gradually the anaesthetic shock began to



wear off, and realization of their plight became more real as it penetrated more into the consciousness.

The strain began to tell, not only on the people but on the mind of the king himself. He began to be afraid of what his people were thinking, and when in 1212 he gathered his armies to make an assault on the Welsh princes and learned that the barons were plotting to kill him, his nerve suddenly snapped. He dismissed the armies, and though he seized a hermit, Peter of Wakefield, who was going about proclaiming that the king would be dead by Ascension Day, he was too late to stop the story from spreading throughout the length and breadth of the country.

In the following year the Pope declared the throne of England forfeit, and the King of France appointed himself the Pope's champion and assembled a fleet at Boulogne to carry an army to seize England. Though the barons and people would even now have responded to a call to keep the foreigners at bay, John feared what would happen if he brought the barons together, and seeing that there was only one way out he took it.

He suddenly declared himself penitent and ready to obey the Pope's commands in all things. Thus he removed the threat of a French invasion.

But this very threat had rallied the barons, and though it might no longer exist, their determination to put right the enormous injustices of the past decade and to put an end to tyrannical rule did not slacken. The lead was given by the barons of the north. Summoned to Portsmouth to join in an expedition to crush the rising power of France, they refused to obey. John crossed the Channel with what forces he could muster, and when in the following year he demanded scutage for the support of these forces, once more the northern barons refused his demand.

Heartened by this example, in the next year, on John's return from France yet again a defeated king, his mercenary army dispersed, the eastern barons, seeing in John's present weakness an opportunity not to be missed, joined cause with the northern barons. Under the guise of a pilgrimage, northern and eastern barons met at Bury St Edmunds, and there took an oath that they would withdraw their allegiance from the king unless he restored to them their "ancient and accustomed liberties".

Deprived of any means to resist them physically, John still refused to listen to their arguments, demands and threats, when through Langton, now installed as Archbishop of Canterbury, his advisers made every attempt to persuade him. But the barons' determination

intensified, and in the spring of 1215 the northern and eastern lords joined forces near Stamford on the Great North Road, and marched on London where the mayor and citizens were waiting to open the gates to them.

John was at Windsor, and hearing that the barons of the south-west were on their way to join the coalition of the north and east, which left him entirely alone, he agreed to meet the barons in a meadow beside the Thames called Runnymede.

The meeting took place on 15 June, 1215, and there John was presented with a document which the barons had drawn up with the advice and approval of Langton, who had acted for the king in the negotiations.

In the circumstances, and taking into account all that they had suffered for so many years, the demands set out in the document were not excessive, but were, in fact, eminently reasonable and just. They did not aim at making revolutionary changes, but laid down the recognized and fundamental principles for the government of the realm in accordance with old-established law and custom.

The document claimed that neither in the Crown nor anywhere else did there lie any power or right to override the laws and customs or to change them without the common consent; and it asserted the right to resist in arms any attempt made to override or change them, even if the attempt was made by the king.

Having established this, it laid down certain basic principles of justice which were to be accorded to every man and woman in the realm. No man might be punished without a fair trial; punishment must be proportionate to the offence; and justice might not be denied or delayed, nor sold to any man. It reaffirmed certain feudal rights of lords over their vassals, and it claimed that demands beyond these rights might not be made without the sanction of the Great Council of the Realm, duly summoned according to recognized form. This clause became the basis of the doctrine that the Crown cannot impose additional taxation without the assent of Parliament.

In no position to refuse, John reluctantly gave his approval to the Magna Carta. Immediately copies were made and sent to all the sheriffs, who proclaimed it in the courts of every county, hundred, city, borough and market-town, so that all men should know what their rights were. Unhappily a section of the barons by their tactlessness and arrogance provoked John to attempt an early revenge. He plotted to reduce them to impotence and they resisted. At first the king was successful, but summoning the hated French to their aid, the barons fought back. As the war was reaching its climax, John

caught dysentery, and during the night of 18 October, 1216, he died, aged forty-eight.

Intended to restore their ancient liberties to a people which had suffered personally at the hands of a tyrant king who still sat on the throne, the Magna Carta in effect went much much further than that. It did restore the liberties, and those who had drawn it up had done their best to make certain that so long as the nation survived, those liberties could never again be put in peril. By it John declared: "We grant to all the freemen of our realm, from us and our heirs for ever all the undermentioned liberties to have and to hold for them as our heirs from us and their heirs."

But it also established two extremely significant precedents. First, though government was exercised by the king it was to be based on the law and rooted in justice, or it was not to be accepted at all. The second was that which denied the king the right to impose taxes without the consent of the Great Council.

For seven and a half centuries now the rights and privileges laid down in Magna Carta have been firmly defended by the people of Britain, and they have become recognized the world over as the basis of democratic liberty.

## *The Model Parliament*

### *The Beginnings of Parliamentary Democracy*

THE CLASSICAL world never knew popular representation; that is to say, whenever a council met, its members were there to pass their individual judgments upon the issues placed before them with no consideration at all of the views of their class, profession or trade. In this the Classical world differed from Anglo-Saxon England; for example, where it was customary for the Reeve—the official who was either the steward or bailiff of an estate appointed to maintain order, collect dues and supervise labour—and the “four best men” of the town to attend the Shire-moot, or council. The Town-reeve and the “four best men” were elected by their fellow-townsmen and were required to put the electors’ views and wishes before the moot.

With the establishment of the feudal system after the Norman Conquest, this system was continued and indeed extended from the shire-courts right up to the King’s High Court at Westminster. The greatest tenants-in-chief, whether bishops or barons, were required to attend the High Court by writs of summons sent to each; in other words, they did not enjoy representation, but had to attend in person; while on the other hand, the lesser tenants-in-chief and the cities and boroughs were required to produce two representatives from each shire, city and borough to do their duty for them, and the lesser clergy were granted the same advantage.

The business of these representatives was judicial and financial, and work of this kind had long been done on the representative principle in the shire-courts. The summons to Westminster arose out of the fact that by degrees the justice of the King’s Court began to supersede the justice of the local, popular, feudal courts.

By the time that Henry II (1154–1189) had established his very expert *curia regis*, or King’s Council, which no other court could match either in the power it wielded or in the matters it could judge, the High Court at Westminster had achieved such a reputation that the vast number of petitions presented to it—many of which in earlier times would have been presented to the lower courts of the

manor or shire—made it necessary for the King's Council to set up three committees to deal with them. These committees were known as Common Pleas, the Court of Exchequer and the King's Bench; and it was when these three committees met together in one body that we find the word *parliament*—meaning *deep discussion*—first being used.

During the reign of King John, the barons, by means of Magna Carta, attempted to limit the power which the king wielded over the country through his Court at Westminster; in other words, they tried to limit the extent of the jurisdiction of the King's Court. In this they failed, and in the reign of John's successor, Henry III (1216–1272), the system became more firmly embedded in English national life.

The next important step forward was taken in 1265, when the Earl of Leicester, Simon de Montfort, led the barons in opposition to the tremendous personal power which the king was gradually seizing, and eventually took up arms against him and defeated him. Making himself virtual dictator, he summoned what some historians regard as the first real Parliament.

Simon had an unswerving love of justice and strong religious feelings. He had at heart no less what he believed to be the rights of the people than the privileges of the barons. He wanted the law to be predominant, but not a law interpreted for the good of one man.

It was to further these beliefs that in January, 1265, he summoned to a Parliament not only the greater barons and the bishops by separate writ, and two knights *elected* in the shire-court of every county, but also two burgesses from each of the larger towns to represent the freemen and taxpayers.

It was this last which was really revolutionary in the history of government in England up to this time, for the burgesses had no right in law to refuse their consent to the imposition of this system of taxation called *tallage* if it were demanded by the Crown. Indeed, only a few years earlier, some citizens of London had been imprisoned by Henry III for opposing the imposition of a tallage.

The effect of de Montfort's summoning of the burgesses was much more far-reaching than he could have visualized. In Parliament for the first time—and from this time burgesses sat in every Parliament—the ordinary citizens had a voice in the financial affairs of the country, and could use their influence to determine what taxes should or should not be raised.

Exactly five hundred years later, a British Government heavily

loaded with debts, hit upon the idea of raising money by the sale of stamps which had to be affixed to certain documents before those documents became effective. On 5 February, 1765, the House of Commons passed the Stamp Act, and immediately attempted to impose it also on the American colonies.

The American colonists had for some years been protesting against the tax on land imposed by the Parliament at Westminster for the purpose of paying part of the cost of the British armies stationed in America. They argued that they should not be taxed by a body in which their voice could not be heard. The Stamp Act brought matters to a head, and the resentment of the colonists was only prevented from boiling over on this occasion by the British Government which had passed the Act being driven from office before the Act had become effective. The next Government repealed the Act, but at the same time insisted that it had full authority over the colonies.

Over the next seven or eight years the colonists grew louder in their complaints and more warlike in their behaviour, until the situation exploded in 1775 with the colonists declaring war on the British. The principle for which the colonists were fighting was summed up in their slogan: "No taxation without representation", and this has, in fact, become a basic principle of democratic government, the seeds of which were sown by Simon de Montfort in 1265.

But the introduction of the burgesses had a more immediate effect than this. In feudal times, land had been the only source or direct taxation, and for this reason only the landowners had been consulted. Soon, however, wealth derived from commerce began to approach very close in value to the value represented by land. When this became evident, it did not long escape the wit of the king that a tax on personal property could be a lucrative source of revenue. The fact that the burgesses were already called to Parliament automatically meant that the rich new merchants were represented in Parliament, and could be taxed without any principle of justice being affronted, or a new principle having to be introduced. The transition was, therefore, painless, almost unnoticed.

By chance this all came about when the throne of England was occupied by one of the most intelligent and law-respecting kings ever to sit upon it.

Henry III survived the death of de Montfort on the battlefield of Evesham by seven years, and was succeeded by the son who had defeated his enemy, Edward I. Two years before his father's death

Edward had left England for a Crusade to the Holy Land, and when he eventually landed at Dover on 2 August, 1274, he had already been king for two years. Though the kingdom to which he returned was outwardly peaceful and well administered, it was not long before the new king embarked upon a series of reforms which were to have a most significant effect on the future development of the kingdom and its institutions.

For a proper understanding of these reforms, it is necessary to know something of Edward himself. He was thirty-three years old when he came to the throne, upright, broad-shouldered, with lithe, sinewy limbs, his once fair hair bleached and his skin permanently tanned by the suns of the Holy Land.

From his boyhood he had been raised as a warrior, and his reputation in arms was equalled by none of his subjects. He had had little time to read, but though no scholar he could write French with fair ease, Latin a little less certainly and corresponded with his brother-in-law in Spanish.

He had one great intellectual passion—the study of the law—which he had first begun as a young boy under one of his father's justices, Hugh Giffard. Now his mastery of legal argument was as formidable as his mastery of arms.

He feared no man, but while strong-willed he was at the same time magnanimous. Swift to anger, he was equally swift to forgive. A contemporary once said of him, "He is a king terrible to all the sons of pride, but gentle to the meek of the earth."

He hated every kind of waste and extravagance. His father had been reckless with money to the point of almost continuous embarrassment, and Edward was determined as king not to suffer the humiliations to which he had had to submit as prince. He was determined to be master in his own house, but again unlike his father he was determined to be so not in opposition to his barons, but in friendship with them. For this reason he did not try, like his father and grandfather had done, to set himself apart from them. In this resolve he was fortunate that most of them were of his own age or younger; they had fought with him at Evesham; and had accompanied him on his Crusade. Whether consciously or not, they recognized his superior qualities, and if they could not count themselves among his intimate friends, they were none the less eager to have his royal approval.

The kingdom was managed by the great clerks of the State departments that had grown out of the royal household. The two oldest of these were the Chancery and the Exchequer, which had

first evolved in Anglo-Saxon times. To these two, Henry II had added the Wardrobe, which in the hundred years of its existence by the reign of Edward I had been transformed from an actual department for providing royal clothing into an office of finance and administration.

The great clerks and their myriad assistants, trained by and drawn mostly from the Church, were expert public servants, who, no matter what happened in the State, remained unchanging. They it was who laid the foundation of the great and famous British Civil Service of modern times; and like their successors of the twentieth century they, in the thirteenth, exercised a stabilizing influence on every aspect of State.

Despite this well-organized administration, however, Edward knew that there was much room for reform in his realm, and even before his coronation festivities were over he had set out on a progress. As he travelled about the country to the enthusiastic welcome of his common subjects, what he learned convinced him more than ever that changes must be made.

In order that these reforms should operate for the justice of all, he first appointed commissioners to go throughout the length and breadth of the country to hear all complaints. He urged them to carry out their work with despatch, and he was obeyed with such alacrity that the inquiry was completed in the amazingly short time of four months.

Based on the commissioners' findings, Edward drew up his first list of changes. These, however, could not become law until they had been issued under the king's seal and publicly witnessed and approved in a Parliament of the nation's highest council. In the spring of 1275, therefore, he called his first grand council and court, to which he summoned the earls and barons, the great officers of the Church and, through the sheriffs, four elected and representative knights from every county and four merchants or burgesses from every important town.

"And because elections ought to be free," declared the writ from the king to the sheriffs, "the king commandeth upon great forfeiture that no man by force of arms nor by malice nor menacing shall disturb or hinder any to make free elections."

When at last those summoned had made their way to Westminster they were presented with what later became known as the first Statute of Westminster. It was a long document running to fifty-one clauses which aimed at redressing many of the wrongs of all classes and sections of the population. It was for this reason that Edward



summoned the elected representatives, for he needed their approval of those measures which particularly concerned them.

Approved and passed by Parliament, copies of the Statute were sent to all the sheriffs, and it was proclaimed in the courts of every county, hundred, city, borough and market-town, and all judges, sheriffs and bailiffs were commanded to enforce its provisions. He also caused a copy sealed by his seal to be kept at Westminster, and thus inaugurated the system by which laws could be recited in courts not from hearsay but by quotation, and so became capable of being acceptable as evidence.

For the next twenty years Edward continued his great work of reform, and each time he prepared new ordinances, by which the reforms were made legal, he summoned Parliament. In 1295 he summoned the most comprehensive Parliament that had met in England up to this time. It was so representative of all sections of the community that it has become known as the Model Parliament. From this time onwards the powers and authority of Parliament began to increase, and never at any time thereafter could any monarch in England hope to rule against the will and wishes of the High Court of Parliament assembled at Westminster, though some now and again did try.

These early Parliaments were held in a single chamber, at the upper end of which sat the king on his throne. At his feet sat the Chancellor—on one of the four wooolsacks arranged in a square on which sat the council—the Justices of the King's Bench on the Chancellor's right, the Judges of the Common Pleas on his left.

The council was the inner core of Parliament. Outside this inner square, the bishops and abbots sat on benches running down from the right of the throne, and the earls and barons on similar benches on his left. At the lower end of the chamber, beyond the bar, stood the Commons, led by their leader, later known as the Speaker.

When the Chancellor, or some other councillor, had explained why Parliament had been summoned, the various Estates—the Lords Spiritual, the Lords Temporal, the lower clergy, the knights of the shire and the burgesses, making five in all—withdraw each to separate rooms, and there debated what the king and his council proposed doing and agreed upon their answers. When all were ready, the five Estates returned to the Parliament chamber and gave their decisions through their leaders. The majority decision was then made the decision of all.

Within half a century of Edward's death, from this single chamber, Parliament split into two parts or Houses. The bishops, earls and

barons met by themselves; the lower clergy ceased to take part in any proceedings which did not affect the Church; while the knights of the shires and burgesses joined together. Less than a century later the separate work of the two main groups, Lords and Commons, had become more important than their joint work in common session.

It was in the reign of Henry VIII that Parliament, however, really came into its own. Henry early formed the habit of doing everything through Parliament, and so created the impression that nothing could be done without Parliament. Now, instead of meeting for a few weeks, it sat for years at a time. This gave it a stability, a solidarity, and sense of tradition, a body of rules and customs and a mastery of politics. Soon it had developed a will of its own and began to deny the Crown all sorts of control it had exerted before, and eventually established its claim to be the superior in the realm.

In no other country did parliamentary government develop along the lines of the English parliamentary system. The time was to come when the strengths of the English system led to its adoption or to its being imitated in every quarter of the globe. Probably no other national institution has so exerted an influence on so many of the world's inhabitants as that indirectly exerted by the English parliamentary system.

## *The Invention of Gunpowder*

### *A Revolution in Man's Ability to Kill*

SLOWLY, CAREFULLY, as silently as possible, though they were extremely heavy and it was difficult to avoid rumbling them through the stone passages, the conspirators brought in their thirty-six barrels, spread them about the vault. Half a dozen times they were moved, arranged differently, put into a shape which might give the maximum destructive effect, as Fawkes, Catesby, Rokewood, Percy and the others argued over the relative merits of piling them one on top of the other in a heap, forming them into a hollow square, spreading them in a semicircle, like a necklace. There was the question of fusing them: would an impregnated rope give a sure result? Would it be best to open each barrel, allow a little of the powder to spill over the floor of the vault? Then it could be sprinkled out of the door and up the stone steps to where Fawkes or some other nominated conspirator would light it and run for shelter.

Getting access to the vault and to this quantity of gunpowder had taken time, and now, when it was in position, the plotters separated to consider their separate parts in the plan which would go into operation when the Sovereign and his Parliament had been blown to pieces. This, God willing, would happen on 5 November, as James I was opening Parliament. The intervening months were only just enough for the conspirators to arrange details of the government which would take over on the afternoon of 5 November, 1605. No doubt there would be angry, even sorrowing subjects of the king when it happened; but there would also, among the Catholics, be many who rejoiced. For it was the latest measure of repression against Catholics which had built resentment to this pitch, a resentment strong enough for regicide, and there would be plenty of sympathy for the Catholic cause. After all, it was not the first time a king of England had been murdered; it was not likely to be the last.

Someone—and to this day his name is secret—sent an anonymous letter to Lord Monteagle. Monteagle was a Catholic and a devout one, but he was profoundly shocked at the information he now

read: a huge quantity of *gunpowder*—a wicked word in itself—was being secreted into the House of Lords, might well be there already, and it would go up in an explosion to rock the whole of London the moment King James began to speak.

Frantically, for there was little time to lose, Monteaule summoned all the nobles and courtiers known to be loyal, told them of the fantastic “gunpowder plot”. The building would have to be searched from end to end, its every point of entry guarded, until the ceremony was over: the plotters might not bring their powder in until the last moment, it might be in wine barrels, anything. There were countless tunnels and vaults, it could be anywhere, and a dozen barrels of this lethal, unpredictable substance anywhere in the building would easily destroy King and Parliament. As for the thirty-odd barrels hinted at—the thought was too appalling to contemplate. Pieces of James and his legislators would whirl round the sky for centuries.

They found Guy Fawkes on 4 November. He was huddled into the chilly corner of a cellar not far from the gunpowder vault, ready, a day in advance, to light his fuse. They dragged him out, beat and tortured him, learnt where the powder was hidden and rushed the barrels out into the open air before they could explode: then they took him away. After hours of the most terrible torture they dragged from him the names of the other conspirators, and they were all, with Fawkes himself, executed.

To this day the vaults under Parliament are ritually searched each year, at the opening of Parliament: the 5th of November is still commemorated by burning effigies of Guy Fawkes and letting off large quantities of gunpowder in the form of fireworks. The Gunpowder Plot is history—though there are some who maintain it never took place. They are a small, disbelieved, minority, but they claim it as a dastardly Protestant scheme to justify severer penalties on the Catholics; they say the barrels of “gunpowder” contained nothing of the sort, were secreted there by Protestants in order to be melodramatically “discovered”; that Guy Fawkes and his “conspirators” were only unfortunate Catholics who were tortured, executed, for a purely political end: such was the magic—the horror—of gunpowder, that a plot involving it would be sure to rouse not only rage but panic.

Gunpowder is the oldest, the most famous, of all explosives, the one with vastly the greatest historical significance, the one of whose history we know least. Long before its introduction to Europe, there were flaming, sizzling, stinking compositions of various kinds,

man-made phenomena called "wildfire". Substances like charcoal pitch, sulphur, saltpetre, went into them in different proportions and with different results. The results were spectacular, even frightening—but "wildfire" was fire, not an explosion. The first man to manufacture a substance with the properties we associate with gunpowder was Roger Bacon. The first man to make use of these properties was Berthold Schwartz. Of Schwartz we know little, but Bacon's achievements in science and philosophy have made him a figure of some importance. He was born in about 1214, at Ilchester in Somerset: seven centuries after this presumed date, just as a war was beginning which would use his invention and its more deadly successors to the full, a brass plaque was fixed to the wall of the Ilchester church, by "a few admirers of his genius". The plaque recorded that, apart from his prophecies of "machines to propel vessels through the water without sail or oars; of chariots to travel on land without horses or other draught animals; of flying machines to traverse the air", Roger Bacon "first made known the composition of gunpowder".

Although he did indeed "first make known the composition of gunpowder", it is unlikely that Bacon invented it. Probably he was the first man to establish its explosive property: before Bacon's time the powder had been a frightening toy, which made smaller, bigger, brighter, darker and differently coloured flames according to the proportion of its ingredients. But with Bacon we learn that we can "call up thunder and destruction" by a mixture of "saltpetre seven parts, five of young hazel twigs, and five of sulphur"—or, more exactly, to quote his own subsequent formula, 41·2 per cent of saltpetre and 29·4 per cent each of carbon and sulphur. One reason why Bacon was able to explode his mixture was that the saltpetre, which had previously been scraped from walls or taken from piles of animal refuse, could now be purified by crystallizing its solution in water. Alchemists had just discovered that all salts could be obtained this way, in a form purer than ever before: with this pure saltpetre (or potassium nitrate, to give it a chemical name), Bacon was able to make an explosive mixture, write down its formula.

Probably he knew nothing of its propellent power, had no idea that guns would some day be made using this power to fling cannonballs at an enemy. The discovery of this important property was made, as far as we can tell, by Berthold Schwartz, who lived some hundred years after Bacon, in Germany. Legends have grown up around him: he is Berthold Schwartz, Bertholdus Niger, Black Berthold. Like Bacon, he is said to have been a Franciscan monk,

and there is an inscription below an old engraving of Berthold which calls him "inventor of the art of using firearms, in the year 1380". The date is questionable as there is an illustration of a primitive gun in a manuscript of 1325. Our facts about Berthold are so vague, so imprecise, that he is almost a legendary figure. He has the credit for inventing the first firearm and as no one else has come forward to claim the honour, it rests with him. The invention altered the history of the world in countless ways and at different periods: in most pictures of Berthold there is the figure of the devil in the background, directing operations.

Gunpowder, because of its awe-inspiring, magical properties, was developed more as a black art than a science. There were strange tests for the purity of its ingredients: "When thou buyest or makest saltpetre, and will find whether it be good or not, so thrust thine hand thereinto. If thine hand become damp, then it is not good: but if thine hand bide dry, then it is good. Also touch thine hand with thy tongue: if thine hand be salty, then the saltpetre is not good. But if thine hand be sweet, then it is good. And if thou wilt try whether sulphur be good or not, take a lump of sulphur in thine hand and lift it unto thine ear. If the sulphur crackle, so that thou hearest it crackle, then it is good: but if the sulphur keep silent and crackle not, then it is not good. . . ."

For charcoal, the wood of poplar or lime was considered best. If it were mixed in the correct proportion with "really good and well refined" sulphur and saltpetre, the result would be an explosive which would ignite with great power, and indeed, until the middle of the nineteenth century when its place began to be taken by other explosives, it held undisputed sway in warfare and in mining. The proportion of its ingredients varied considerably at different times and in different countries, and the methods of grinding it developed over the years from mortar and pestle to a complicated factory process. The main problem was controlling the substance, after its three non-explosive, simple ingredients had been mixed and it was suddenly a lethal weapon. It seldom went off spontaneously—though this happened from time to time, to the alarm of its practitioners—but when packed into a cannon and ignited behind a projectile it was likely to destroy cannon and all around it. King James II of Scotland was killed this way by the bursting of a bombard at the siege of Roxburgh Castle in 1460, and it was not until the end of that century that an effective control was achieved.

After the discovery that gunpowder could be used to propel bullets from guns, a discovery that wrested North America from

the American Indians, India from the Asians and large parts of China from the Chinese (the people who are believed to have invented it in the first place, hundreds of years before Bacon or Berthold, and forgotten the art), the next major development in its use was the invention in 1814 of the percussion cap. Primed with fulminate of mercury which produced a hot flame when struck, it did away with the tedious flint and steel, or the "slow-match" fuse, steeped in saltpetre and limewater. Now, when a firearm could be discharged by pulling a trigger, the ultimate in offensive weapons had been achieved—or so it seemed. Gunpowder had a few unpleasant characteristics—it was easily damaged by wetting, it gave off quantities of dense smoke, it could go off unexpectedly or not at all—but it was the best, the only, explosive man had devised.

Then, in about 1880, it began to be supplanted by "smokeless powder", and later by more powerful explosives like TNT. These could be stuffed, in small quantities, into hollow "shells" to explode among the enemy, doing immense damage.

But from the day of Black Berthold's discovery that the powder would fire guns, the making of "gunpowder" became a matter of national survival. Every nation had to have its stockpile, if not of gunpowder, then of its ingredients—much as nations haggle to-day about the possession of atomic weapons. Naturally occurring potassium nitrate—saltpetre—is a rare commodity, except in the soils of Spain and India, so most countries were forced to set up "nitre beds", vast compost heaps where the stuff would form in decaying animal or vegetable matter. Farmers who already had these heaps found themselves having to hand over a proportion of the contents to their landlords: in Sweden, farmers paid their taxes with it.

Then, towards the end of the nineteenth century, it was discovered that "Chile saltpetre", or sodium nitrate, which abounded in South America, could be converted to potassium nitrate by treatment with sulphuric acid: there was a mad rush to obtain concessions to mine it. Huge quantities were dug up and within a few years the supply was in measurable distance of being exhausted; but by now the European countries, realizing that it would be difficult to get adequate supplies in time of war, began to experiment with processes for the "fixation" of nitrogen gas from the air. The experiments were successful, the atmospheric nitrogen could be fixed into ammonia or nitric acid and used for the manufacture of all forms of explosive. This process is now of fundamental importance in making nitrogenous fertilizers for the soil.

Gunpowder, the first explosive, has had a greater effect on mankind than any of its more powerful successors—merely by being first. The Canadian Indians, when Champlain opened fire on them with his primitive “arquebus”, fled in screaming terror; the inhabitants of Madras did the same before Clive; the southern states of America, parts of South America, the whole of the West Indies, were peopled by unwilling negroes from Africa, captured at gunpoint by the Arab slave traders. By the time TNT, ammonium nitrate, ammonal, dynamite, picric acid, guncotton had been developed, the “black art” of Berthold Schwartz had become universal: a Great War from 1914 to 1918 killed and maimed millions—and achieved nothing: the sides were too evenly matched.

A generation later, the war against Japan ended suddenly with the detonation of a totally different kind of explosive, an explosive which used, not the energy of a chemical reaction, but the vastly greater energy made available by the splitting of what had been universally accepted as the unsplittable, the smallest thing in existence. History repeated itself: here, until the rest of the world got hold of the secret, was a “gunpowder” with which one nation, had it been so minded, could have dominated the world. (Though even in 1945 the new weapon merely hastened the end of a long war which had already been won by “conventional” explosives.)

Unlike gunpowder and the other chemicals, the new atomic explosives— isotopes of uranium and hydrogen—have the power to destroy the world completely, eliminating in a few vast explosions, which would have been incredible even to the horrified discoverers of the Gunpowder Plot, the whole of mankind and his works. The threat is so great, and so obvious, that it may succeed in doing what gunpowder failed to do: stop war altogether.



## *The Black Death*

### *A Calamity that Altered the Economy of Europe*

IT CAME on a Monday, a bright, clear, cloudless day in August; and like the sudden shower that spoilt the day in early afternoon, it was unexpected. It had flourished in London, indeed it was gaining ground in London, but the Londoners were fifty miles away: the village, after learning the news that London had it, had carried on with its day-to-day routine of tending sheep and cattle, bringing in the harvest, quarrelling, making love, grumbling. True, the disaster had spread over half of Europe since it had struck at the Italian ports, its entry points from some source in the unknown East, but what could one expect, over there? They were strange people across the Channel and the North Sea; they had strange customs, strange tongues. No: the "Great Dying", as the German people called it, would never take root in England. Filthy foreigners might bring it to the port of London, but there it would stay, bottled up.

And then, on Monday, it struck the village. Young Martin Todd, just twenty and not long back from a trip to the south of the county where he had been visiting an uncle who sold him a plough, sickened and died. No one but his even younger wife knew of it until Martin was all but dead; she had nursed him in secret, put cloths soaked in water of bay leaf on his burning, blackened brow, held his pain-twisted hands in her own, put compresses on the swellings in his groin and armpits, played to him on the lute, singing from time to time to drown his groans. But it had been discovered: the miller's wife, wondering where Mistress Todd had been these past four days, decided to call. A glance at the fevered face, the great black blotches under the skin of forehead, neck and wrist, a moment's harking to the grunt of anguished, rapid breathing, and Mistress Jenkins was up the road as fast as her legs would take her.

An hour later, they buried him. Some said he wasn't dead; but that was only village gossip. If he weren't dead, he should have been. They burnt his house and drove young Mistress Todd weeping into the wood, to move herself on to the next village—anywhere—and rid them of the plague, the Black Death.

But it was no use. The miller's wife and her husband followed Todd into a hasty grave, the mill joined the farmhouse in ashes. The Baker family died together, all six of them, a week later, and the rest of the village dispersed, setting out in every direction with their goods in carts or on their backs. Some spread the Death to other villages, others settled themselves in a clearing in the wood, made new homes for themselves, a new village—and all of them, within the year, were dead. The first village and its hastily erected successor decayed and crumbled, the cottages fell to the ground and were buried in long grass and weeds, penetrated by trees, obliterated. The two sites can be photographed to-day from the air, through infra-red lenses, like the sites of so many other communities during the Black Death; there are squares and circles in the grass, where once stood cottage, mill and steading.

The Black Death, as it was named, from the black-seeming haemorrhages of blood under the skin, reigned supreme over most of Europe from 1348 to 1350, the worst disaster to strike mankind: an Act of God, against which man was completely, pitifully, helpless. There had been earlier outbreaks in North Africa and another in Europe, the fifty-year cycle of the sixth century, but since then epidemics had been rare. Now, in the fourteenth century, it had struck at almost the whole of Europe, from Italy to Scandinavia, with an undreamed-of virulence. No one could tell what caused it; everyone was familiar with its horrifying symptoms: the complete prostration, burning fever, swollen glands, agonizing pain and black marks under the skin. And death.

We know now that Plague, the Black Death, is caused by *Bacillus Pestis*, injected into the blood-stream by a bite from a flea carried by a rat, and that it takes three forms: "bubonic", from the swollen glands or "buboes" which are a symptom; "pneumonic", affecting the lungs like a drastic and incurable pneumonia; and "septicaemic", spreading over the whole body. Various theories have been advanced and rejected concerning its origins in Europe: one of them suggests that the returning Crusaders in the eleventh century brought black rats—believed to be the most prolific carriers—with them in their luggage, but the skeletons of black rats have been found in pre-historic sites in Switzerland. A theory covering the eventual end of the pandemic was that an invasion of brown rats—which did in fact take place—destroyed all the black ones, but the Plague had begun to die out a year before. As the disease was often accompanied by outbreaks of syphilis, typhus or influenza, there were theories linking it with these diseases and a man owing to syphilis in the

fourteenth century was quite likely to be driven from his home as a carrier of the Plague.

At least twenty-five million people, or a quarter of the population of Europe, were wiped out in the three years to the end of 1350; and in the next fifty years the mortality rose to a third. The city of Hamburg, harder hit than most, lost two-thirds of its population. Over Europe as a whole, it was two hundred years before the population level of 1348 was regained. The effect, however, was farther-reaching than even this "great dying" would suggest. Families that survived were broken up, husbands and wives deserted each other, abandoned their children in panic. These were then, if lucky, adopted by other families; so that now there are thousands of people alive called Jones, Brown, Robinson, Schmidt and Leclerc, whose names, but for the Black Death, would be something quite different.

People went mad with fear, committed suicide. Criminals, the only men who could be coerced into burying the swollen, blackened corpses, were released from their prisons. Opinion divided sharply, as it so often has in times of disaster, into the two schools of "eat, drink and be merry", and maudlin religiosity. Even the reformer John Calvin believed witches had brought the Black Death to Geneva, and he set out to rid his country of them. Others decided physicians were to blame: by their impotent meddling with the Will of God they had multiplied the rigours of His punishment. Rich people, all over Europe, locked themselves in country houses; townspeople closed their streets with chains; a gallows was erected in many a market-place, grim warning to any wandering tinker or minstrel that if he were foolhardy enough to enter he would end up hanging by the neck. Those in the town who were not praying in the churches indulged in orgies of drink and sensuality such as the world had not seen since the time of Nero. Then, as prayers to God seemed unanswered, a few people began to celebrate their own versions of the Black Mass, worshipping the Devil and his works, holding their own "services", with skulls, crossed bones, beasts' entrails and hideous effigies, on the altars of churches from which the clergy had fled.

There is a theory that the Protestant Reformation was brought about by the Black Death and there is much to suggest that it hastened it. The Church was powerless against the disease, no amount of prayer could keep the Black Death at bay: and soon, one by one, priests began to desert their parishes, leaving the dead and dying. Many, of course, did not, and died at their post, a sad testimony to the

futility of their own prayers. Clearly, reasoned the men and women left behind, something was very wrong with the clergy and with religion. But it seems probable that the arrival of a Gautama Buddha or a Mahatma Gandhi might have converted the whole of Europe to some totally different religion—to anything that would take the place of a discredited Catholic Christianity, anything that would make a change. The pace of disillusionment was hastened by the disappearance of so many lords, ladies, knights and squires, people whom the ordinary man looked to for leadership and guidance, who were now shut up in castles and great houses with a cannon or a musket in the window and a gallows on the lawn—and, as often as not, a hastily dug moat between themselves and the rest of the world.

The economy of all Europe was drastically affected. Labour grew short, its market value doubled, trebled. The free labourer demanded higher wages; the villein, whose labour was not free, who was tied to a master, struggled to rid himself of this condition in a new society where labour had suddenly become valuable, could be sold for money or goods. Originally the lord of the manor had taken from his villein service or money as it had suited him: from many villeins it had been money for a generation or more; they had not been called upon to work other than for the good of themselves and their families. Now, when the landlord, faced with a catastrophic shortage of hands, willing or unwilling, to till his fields, bring in the crops, refused money and demanded labour, the villein was enraged.

The landlord's dilemma was serious. Half his rent-paying farms, his domain land, were untilled, the turf and weeds were growing over them. His cottages were falling to bits for lack of inhabitants to keep them dry, workmen to keep them in repair; the thatch blew from their roofs like thistle-down. And the few labourers surviving, these now rose in open mutiny: their labour was a valuable commodity, they would sell it dear. The landlord solved a part of his problem by turning over arable land to sheep pasture. King Edward III's importation of Flemish weavers to teach his own their continental skills, coupled with a rapidly growing demand on the Continent for English wool, made this obvious move a profitable one. There were still a hundred years to run before it would be necessary to evict ploughmen to make way for sheep: in 1350, there was room and to spare.

Wages rose sharply and it is interesting to compare prices before the Black Death and after. Things like wheat, rye, oxen stayed at

much the same level; everything involving labour—iron nails, a jerkin, a re-thatching—doubled, so that the position of the labourer, with his as yet modest wants, improved greatly after the Plague. The depopulation of the country, which the contemporary poet Petrarch had described as that “vast and dreadful solitude”, doubled his wages and kept his foodstuffs at much the same price. His wage, if he could hang on to it, would buy a bellyfull.

The next and so far final epidemic of Plague in England was in the years 1664 and 1665. It had recurred briefly in the fifteenth and sixteenth centuries, had seemed to disappear until its return in the autumn of 1664. A few cases were noted in London, in October, but these were not unusual, and it was not until May, 1665, that it began, in the words of the contemporary Dr Boghurst, to “creep down Holborn”. The process, from western suburbs to eastern, took six months, and as records were kept carefully we can, if we look at them, almost share the panic which the inhabitants of London must have felt: 43 people died that May; in June, July, August and September the figures were 590, 1,370, 17,036 and 31,159. After September the numbers declined. Of a London population of 460,000 (of whom two-thirds are believed to have fled during the epidemic) 68,596 are listed as dying of the disease—and it is likely that there were more, that people whose relatives claimed they died of “spotted fever”, had the Plague. It was no longer called the Black Death—but it was just as deadly.

There is a theory—Plague has lent itself to many—that the disease vanished because of the Great Fire of London in 1666, but as it simultaneously disappeared from other towns, this seems doubtful.

Since 1666, there have been outbreaks in other parts of the world, the most recent (on which the novel *The Plague* by the late Albert Camus is based) being in the late 1940s, in North Africa. The last accurately documented ones were in Australia in 1900, South Africa in 1901 and Manchuria in 1910. An epidemic in Egypt from 1833 to 1845 had provided the first opportunity for medical science to study the disease *in situ* and much valuable data was collected; this was supplemented in Sydney and in Cape Town. It was discovered that there was virtually no cure—any serum had to be injected before the symptoms became manifest—but that injections with a vaccine gave good protection to those who had not contracted the disease. Bubonic cases—which accounted for three-quarters of the total and lent the inaccurate name of “bubonic plague” to the disease—were often mild, whereas the pneumonic and septicaemic cases were usually fatal within six days. Research showed that not only

## THE BLACK DEATH

rats but marmots and ground squirrels could spread the disease. Mortality rates varied from 95 per cent (Hong Kong in 1899) down to 34 per cent (Sydney in 1900).

The study of the Black Death—the Plague, during its most catastrophic, fourteenth-century visitation—has recently become a subject for scientists and sociologists. It is the only calamity of which we have record which approaches that of a nuclear war. Perhaps, by finding out how people behaved under the impact of that disaster, we can profit from the troubles of the fourteenth century, work out a plan for keeping civilization alive in the twentieth. And by preparing for disaster we may avoid it.

## *Joan of Arc's Victories and Martyrdom*

### *The Creation of French Nationalism*

AT THE beginning of the fifteenth century, France, as a kingdom, suffered such misfortunes that it almost disappeared. The first part of the Hundred Years War with England had ended with France recovering all the territory won by Edward III and the Black Prince after their many victories, of which Crécy and Poitiers were the greatest. By the Treaty of Bretigny in 1360, only the cities of Bordeaux, Bayeux and Calais remained in English hands and a wise monarch, Charles V, ruled the country.

But he was succeeded by a son, Charles VI, who went mad and a civil war broke out between two great nobles, the Duke of Burgundy and the Duke of Orléans, the King's brother. It ranged, roughly, the men of Picardy, Flanders and Burgundy against western France, and France south of the Loire. The Burgundians represented mercantile France, the country which traded with England and the North; the Armagnacs, as the followers of the Duke of Orléans were called, feudal France and the national tradition.

Then in 1415 Henry V invaded France and won the great battle of Agincourt. The Burgundians allied themselves with him, and the powerful city of Paris was Burgundian in sympathy. Henry V married the mad King's daughter Catherine and it was agreed that he, and not the Dauphin, the French king's eldest son, should succeed to the throne of France. The Dauphin, whose mother, Isabeau of Bavaria hated him and had allied herself with the Duke of Burgundy, fled across the Loire where he held a small court at Chinon. Isabeau had even declared that her son was illegitimate and, therefore, not the real heir to the throne.

Charles, the Dauphin, was not at this time of his life an inspiring figure. He was young, plump, bandy-legged, usually dressed in padded velvet, for he hated the cold, with a thick bulbous nose. He seemed to live for the small pleasures of petty intrigues of his court and not to want to fight for his inheritance. Though some brave soldiers such as Dunois and the Duke of Alençon were with him, he was inclined to take the advice of unworthy favourites and do

nothing. When Henry V had died before the mad Charles VI, the kingdom was disputed between the Dauphin and the infant English king at Windsor, Henry VI.

France, a much more civilized country than England, with many more great cities and a much richer trade with Italy and the East, had never been held together by royal authority, as England had been under the Norman and Angevin kings, and by a national Parliament which checked the royal power but also supported it against rebellion by barons. If the King was weak, France fell to pieces, and the links between the feudal north and the great southern towns, such as Toulouse or Marseilles which were more like Italian cities, disappeared. England, for a short time and in a less serious form, was to know something similar to the Burgundian-Armagnac civil war in the Wars of the Roses which broke out in the second half of the century.

Parts of France, particularly Picardy, Normandy and Brittany and large tracts of south-western France, were completely desolated by the foreign and civil wars which had been lasting since around 1360. "There is no more heard throughout France la Douce the sound of cock or hen", wrote a chronicler of the north. People took to living in caves and to cannibalism, and it is said that the very farm animals, when they heard the alarm bells ring from the churches, rushed for shelter spontaneously. The armies which fought each other had no respect for the people and indeed the many mercenary troops—Swiss, German and Scottish who fought for the Dauphin or the Duke of Burgundy—were often not paid and lived off the country. More and more people left the land for the free cities, for these with their strong walls and towers could resist invaders and freebooters.

So there was dreadful suffering in parts of France, though in regions untouched by war, particularly the cities, prosperity was increasing. But all the country suffered not only from political uncertainty but from a grave moral crisis. Christendom was falling to pieces. The Turks had reached the Adriatic and the pest raged in Venice. There were two Popes, one in Rome and one in Avignon. Strange superstitions abounded; stories were rife of comets dripping blood, of the lamp of the Sacrament changing from red to blue, of the whore of Babylon appearing in the cities of Italy and France. Religious feeling was, however, still intensely powerful and this helps to explain why Joan of Arc's voices and her claims to divine inspiration were to count as much as her devotion to the true King of France, the Dauphin, and her love of country.



Joan of Arc was born at Domrémy in Lorraine, near to Vaucouleurs, a town which owed allegiance to the Dauphin in spite of its being surrounded by Burgundian territory. Her father was a small farmer, Jacques d'Arc, and Joan was one of five children, two sons and three daughters. Her mother Isabel was a woman of strong character. Joan took her part in the workings of the farm. From earliest youth she seems to have been high spirited, physically vigorous and extremely pious.

One summer day in 1424 she was lying in a meadow, resting after a race she had been running with her friends, when someone told her she was wanted at home. However, she had not been sent for and whilst, surprised, she dawdled in the garden on her way back, she had the first of her many visions. The visions seemed to be, first of all, a perception of a strong light—not that of common day—which was, in her own words, deep and kind, near her, and then of a voice speaking out of the light, "*Très bien et bellement*". The visions, at first, were not frequent, happened both at noon in the fields or at night and the purpose of the heavenly voices seemed merely to tell Joan that she was the servant of God and must hold herself ready to do his bidding. She soon lost all fear of these voices and came to love them. Later, she came to know one voice as that of St Michael, the Archangel, and then occasionally other voices as those of St Margaret and St Catherine. The voices became always a little more positive telling her that she had a great work to do and would be upheld by God. St Michael began to tell her that she was to leave father, mother and friends and to serve the Kingdom of France as a soldier and leader of men.

By the time she was seventeen, in 1428, her visions now told her that she was to go to the court of the King of France. She went therefore to Vaucouleurs on the excuse of aiding a cousin in her pregnancy, and attempted to persuade the governor of the town, de Baudricourt, to send her to Chinon where she knew the Dauphin lived. She was unsuccessful and de Baudricourt threatened her with a strap or with being handed over to his men-at-arms. She went back to her family.

In October, 1428, the news reached Domrémy of the siege of Orléans by the English. Orléans was the largest of the cities on the Loire which recognized the Dauphin and its loss would mean that the English could take possession of much of France south of the Loire.

Joan went again to de Baudricourt and this time persuaded him to send her to Chinon. Joan left on a horse subscribed for her by

the people of the town, in the uniform of a page, with a sword given her by de Baudricourt. This was in February, 1429. She and some companions travelled mainly by night through hostile territory. They did not reach Chinon on the Loire until mid-March. Admitted to the court after a few days, Joan steered her way through the throng of young courtiers with their puffed-out sleeves and yard-long shoes, the women in their enormous padded head-dresses like the horns of demented heifers, and knelt before the Dauphin. Now the Dauphin had hidden himself among the crowd and left a young courtier of his own age on the throne. If she recognized him it would be a proof of her divine gift and of his legitimacy. She went straight to him, knelt before him and said in her clear, rather deep voice: "Gentle Prince, they call me Joan the Maid, the King or Heaven has sent me to you."

It was not until April, 1429, that Joan of Arc with the Duke of Alençon and the most experienced Armagnac soldiers led an army from Blois to relieve Orléans. The Dauphin, impressed by her recognition of him, had sent her to an ecclesiastical court at Poitiers, where she was examined as to her visions. The priests at Poitiers shook their heads a little at her confident claim that God was directing her—direction could only come from the Church in their view—but found her visions harmless, and, in view of the enthusiasm which she appeared to have aroused already in the royal entourage and in the region, they considered it would be well to let her have her head.

Attention was devoted to the question of why she had dressed herself as a man, but the judges accepted her simple explanation: dressed as a woman, Joan often said, she could neither properly ride a horse nor carry a lance or sword and besides she would be more liable to assault. Another test awaited her after Poitiers. The Dauphin's mother-in-law, Yolande of Sicily, a strong-minded woman, held court at Tours. Joan was sent there to be examined by the Queen and her matrons to see if she was a virgin. She was proclaimed a true and entire virgin and was known henceforward as the Maid.

Even before the triumphant relief of Orléans in which Joan showed quite remarkable skill and valour, the Maid had convinced the common people and soldiers with whom she came into contact that she had a divine mission. The Duke of Alençon became her devoted admirer and taught her the use of arms. After the release of Orléans, the people of the city became convinced she was a saint and when her name resounded in the streets of Lyons and distant

Toulouse and in all loyal cities, Joan of Arc supplied that essential impulse to the supporters of the Dauphin which alone led the people to victory against great odds.

Town after town on the Loire, in Burgundy and in Normandy, opened its gates to the legitimate king. After the battle of Patay, in which the French captured the Earl of Suffolk, the tide seemed to be turning against the English. The English captains, even though France was only half a foreign land, seemed discouraged and the soldiers discontented and half-hearted in battle. The Dauphin, still unwarlike, was persuaded to go to Reims, which fell without a blow. He was anointed king with the sacred oil of the Cathedral—the final proof of legitimacy. Joan, in white armour, with her white banner, knelt beside him in the Cathedral, and among the congregation was her mother and brothers. It was the supreme moment of her career. Her voices had told her to relieve Orléans and have the King crowned in Reims. She had obeyed and succeeded.

Lacking the backing of the King of France, she and D'Alençon failed to take Paris. History was to be determined by the miracle of the Maid but not to be hurried. Joan at her trial stated that, after her troops had captured Melun from the Burgundians and whilst the bells of the town were pealing for the victory, she was standing in the moat when she became aware of the sudden warmth and stillness of her voices and St Margaret and St Catherine spoke to her. This time they came with a solemn warning. Before the next feast of St John in May—it was then April—she was to be taken prisoner. On 23 May, before the walls of Compiègne, she was taken prisoner in an unnecessary skirmish with Burgundian troops. She was sold by her captor to the English for ten thousand gold francs.

Her trial began at Rouen in January, 1431, before an ecclesiastical court. The English, who were determined that she should die whatever happened, preferred that she should be first condemned as a heretic and a witch by a French court. In Pierre Cauchon, the Bishop of Beauvais, they had a clever ally. The court took some three months to draw up the preparatory case, after assembling all possible evidence about the Maid's life. The majority of the court was thoroughly prepared to judge Joan a heretic but to give her a chance to abjure and pass the rest of her life in a women's prison. Only Cauchon, and one or two of his confidants, knew that at all costs, and even if she abjured, she was to be burnt at the stake.

On 24 May, 1491, Joan, grimy from her prison cell, stumbling in a long grey dress of a penitent, was led into the market-place of Rouen. There was a crowd of English soldiers and burgesses of

Rouen in the square, as well as church dignitaries including the Bishop of Winchester, who had presided over the trial at a distance.

After a sermon and a short address by Cauchon explaining why the Church had cast her out, she was hoisted on to a high plaster erection and bound with small chains to a stake on the top of it. A high-pointed dunce's cap with the words "Heretic, Relapsed Apostate" was put on her head; the executioners lit the lower faggots, smoke began to hide her from the crowd. A Dominican monk held a crucifix before her until he had to jump down for fear of being scorched. The executioners poured oil on the flames and vast clouds of sulphurous smoke hid her from the public.

It is probable that she died of asphyxiation rather than burning, for after a short time the flames were beaten down for a moment and, as was the custom, the body, high up on the stake, was shown to the crowd. It was still recognizably a female body, not yet more than charred. When the body was finally consumed, the executioner threw the unburnt heart and liver into the Seine.

The crowd, the majority of whom were eager to witness public executions and which had hooted Joan on her arrival in the square, seemed seized with fear. "We are lost, we have burnt a saint," an English soldier is reported to have said. The dignitaries too left in some confusion of mind. Such was the death of Joan of Arc after a trial which had lasted five months.

By itself, the event did not appear at the time of great importance. The English had got rid of a sorceress who had helped their enemies and now could do so no more. Joan of Arc had finished her work the year before when she had seen the Dauphin crowned King of France at Reims. The King had not lifted a finger to save the Maid and it was scarcely a sufficient excuse to say that nothing he could have done could have saved her from English vengeance.

Joan's martyrdom enhanced to an enormous degree the unconscious feelings her example had released in the people of France, a feeling which already had expression in the new vigour and confidence of the Dauphin's armies in 1429 and 1430. Twenty-five years later public opinion in France demanded her rehabilitation and an ecclesiastical court in Paris annulled the findings of that of Rouen. The Pope formerly revoked the sentence. Her canonization was to wait for many years—until 1920 in fact.

This girl, who died at the age of twenty, possessed exceptional qualities. Brave and resolute, she could hold her own alike with courtiers and rough soldiers and her enthusiasm, backed by common sense, made her a leader of men in battle. She had one attribute of

any military leader—a determination to be “up and at” the enemy and to pursue every chance relentlessly; if the King had been less cautious, her military fame would have been greater. She had, too, an extraordinary ready wit, and stood up to her learned judges at Rouen, frequently exposing them.

These qualities cannot be dissociated from her voices. It was because she believed she was doing the work of God that her self-confidence was effortless, that, for example, she could wear men's dress and armour because they were practical necessities with the greatest naturalness. She never doubted for a moment that she was doing God's work. “I come from the Kingdom of Heaven”, she would say. Her patriotism was religious and her great phrase, “Those who make war on the Holy Kingdom of France make war against Jesus the King,” was an inspiration in her time to all Frenchmen to rally round the monarchy and the Church, and still echoes the unconscious attitudes of Frenchmen to the mythical Being, France.

To the English and Burgundian faction, Joan's voices came from the Devil and were a mockery of Holy Church. She was a witch and sorceress and her wearing of men's clothes a sure sign that she was a loose woman. Many people to-day cannot accept that Joan's voices were the direct guidance of God. Many people will deny the reality of supernatural intervention altogether, and even Catholics who do not deny it can ask themselves why should God and His Son have taken such a direct interest in the success of the Catholic French against the equally Catholic English.

But whatever views there may be about the voices, no one can deny the historical importance of Joan of Arc. Her words, “Frenchmen, divided Frenchmen, pardon each other with all your hearts,” appealed as magical common sense at a time of intense confusion and strife. Loyalty became something wider than the city ramparts or the confines of villages or region. No longer would knights or peasants ride, at the bidding of their powerful feudal overlords, anywhere—changing sides when the feudal overlord thought fit. First loyalty went to the King, not to Baron; to France, not to Burgundy or Brittany.

This new sentiment was born with remarkable strength because it was expressed and acted upon by the Maid of Orléans with such real fervour. Joan of Arc, by her triumph at Orléans and Reims, and by her shameful death in Rouen, was the creator of national feeling in France. Together with Louis XIV who gave nationalism a style, and the anonymous French Revolution which gave it a new universal content, Joan of Arc is the creator of French nationalism.

## *Johannes Gutenberg's Movable Type*

*Learning, Previously the Prerogative of the Few, Sweeps the World*

WHAT YOU are reading is print. This, *this* and THIS are print. If the art of printing were suddenly lost; if this book could only be produced painstakingly by hand, if every letter of every word had to be traced neatly with a pen—the chances are you would not be reading it. Instead of thousands of copies from a press, in a mass-production which makes it far cheaper per volume to produce ten thousand copies than a hundred, there would probably not be more than a dozen in existence: each of them would cost a hundred pounds or more. Without readily available books, newspapers, magazines, few people would bother—or be able—to read. Education as we know it would be unthinkable; the world would revert in a few years to a condition much as it was in the fourteenth century: there would be a privileged, educated élite able to buy or borrow the few works available in manuscript; for the rest, education would be information, picked up by ear. The hundreds of copies of plans, blueprints, for building an aeroplane, a motor-car, an office block, a scooter—these would not be available.

Only poets—whose language is memorable, spoken prose—only poets would flourish.

But of course this is nonsense. If printing were forgotten, if every man and woman connected with the art, every girl behind a typewriter, were to be struck blank by loss of memory—someone would invent it all over again, and quickly. A world like ours cannot exist without print.

One of the few firm facts we have concerning the origins of printing is the name of the man who didn't invent it. His name—an important one, as we shall see—was Johannes Gutenberg: he lived in the fifteenth century, in Germany.

Printing, the transferring of an image by impression, is one of the most ancient of man's skills. The earliest printed book in our possession was produced in China eleven hundred years ago. It was found in a cave in Tunhuang at the start of this century, it takes

the form of a scroll sixteen feet long and a foot wide, and it bears the Chinese equivalent of our date, 16 May, 868. But even this is not the first example: Buddhist charms were printed in Japan and Korea a hundred years before.

So advanced was Oriental printing that in A.D. 932 the Chinese began printing an edition of the classics—and completed it one hundred and thirty volumes and twenty-one years later. Their process of "block printing" is one we use for reproducing pictures; the whole page is carved (nowadays by acid, in those days with a knife) out of one piece of wood or metal. The Chinese language being non-alphabetic, comprising thousands of individual characters representing separate ideas, is poorly suited to modern movable type, with its individual letters assembled into a block; and yet even this revolutionary development took place in the eleventh century. The philosopher Pi-Cheng introduced movable type, urged its general acceptance—and his invention died with him.

It was not until Marco Polo and other travellers had returned from exploring the East that the art of printing became known in Europe, and it was not until the fifteenth century—and Gutenberg—that books were produced by the method. There was a sudden revival of interest, and three methods were tried: the Chinese one, with hand-carved wooden blocks, one per page; a system of movable type, redeveloped from Pi-Cheng's discarded method by Lawrens Coster of Haarlem; and a third, also using movable type, but far more efficiently, developed by Johannes Gutenberg.

Block printing came first, and various seals and documents were made by the process. The printer took his flat piece of wood, a piece slightly bigger than the area he intended to cover with print, and inked each letter carefully on it, in reverse; then he cut away the wood from every un-inked part of the wooden surface and was left with his printing block. The process took time but a practically infinite number of books could be printed from the same blocks. Indeed, one of the disadvantages of the method was that the expensively carved block lasted longer than the demand for the book. Few people could read, and the edition was limited to a few copies; after these had been run off, the block could only be used for lighting the fire.

The answer was movable type. With only a score or so of letters in a European alphabet, it would be simple to cut a number of copies of each from separate blocks. They could then be assembled into the words and sentences of a page, clamped together and printed. When the required number of pages had been printed, the little

blocks could be taken apart and used again. The idea appealed to Lawrens Coster, and he cut his separate letters; whether he then went on to make a mould of each and cast a large number of replicas we do not know. Gutenberg did, and as he produced a better product, more aesthetically pleasing, more legible, than Coster, his name has gone into history as the first European to use movable type. With Gutenberg's work, printing as we know it began.

He was born in Mainz, Germany, about 1398, but for some reason was banished from the town at the age of thirty. He moved to Strasbourg where he developed his first printing press, a practical application of an idea he had been working on since childhood. The press allowed him to stamp out page after page with great speed and he printed with an unprecedented beauty and clarity. We do not know whether the blurred, unattractive work claimed for Coster was in fact done by him—whether he was really a printer or just a man who made type—but we have many examples of the beautiful work done by Gutenberg.

At the end of 1444 he returned to Mainz; presumably the cause of his banishment had been forgotten, though he had seized the opportunity during a visit of the town clerk of Mainz to Strasbourg to have the unfortunate man flung into gaol "for debt". The Mayor of Strasbourg, profoundly shocked at this discourtesy to a visiting dignitary, had him released, threatened to have Gutenberg incarcerated in his place. Quite possibly this high-handed action set off events which made him only too anxious to leave Strasbourg.

In Mainz, he entered into partnership with a rich goldsmith called Fust, a trusting man who spent a great deal of money over the years on Gutenberg's ideas, for no return. The partnership finally dissolved and Fust brought an action to recover his money. Gutenberg was now working on his famous "42-line Bible", but just as he was completing the blocks his press was handed over as reparation to Fust. The latter promptly went into partnership with Gutenberg's assistant, Peter Schoeffer, and published the great Bible in 1456. Gutenberg has rightly gone into history as the printer of this masterpiece, but he received nothing for his labours.

He disappeared for a year and probably made another Bible in Bamberg before reappearing in Mainz in 1460 with another beautifully produced work, *Catholicon*. Those books, quite apart from their immense historical value, are works of art: in 1954 a copy of the first Bible changed hands for £71,400, while a year later one page—all that survived of another copy—was sold for £130. Gutenberg, however, ended his days in comparative poverty with a small



pension granted by the Archbishop of Mainz. He watched in disgust as Fust and Schoeffer carried his invention from success to success. By the time he died in 1468, printing, based on his developments, had been established in Italy and Switzerland and would spread in the next twenty years to most of Europe.

Like Gutenberg, the early printers cast their own type, but printing houses soon decided to specialize in the business of printing, leaving others to make type for them in separate foundries. The trade of type-founder was an honoured one from the end of the sixteenth century to the start of the twentieth, when developments in printing and metallurgy made it often more convenient to cast type mechanically by means of a type-casting machine. After use the type was melted down again.

For three hundred years after Gutenberg the main progress in the art of printing was the development of new type designs. Presses began to be made of iron, not wood; to be used in batteries; but the most laborious aspect of the craft, the picking up of each letter singly and assembling—"composing"—it with others in a composing stick which was then clamped with its fellows to form a page, this was still done by hand. Attempts were made to develop machines which would compose, but they all suffered from two major disabilities: they could assemble the type in the right order, group the letters into words, but they were unable to "justify" the lines to fill the width of the page; and they were unable either to return the matrices from which the type was made to the containers from which they had come. Little effort was saved.

It was not until 1886 and the appearance of the first commercial "Linotype" that these problems were solved. The machine, as its name implies, cast a whole line of type in one piece, "justified" it automatically, and then returned the matrices to the magazine for further use. It was worked by a keyboard, like a typewriter. It had several disadvantages of its own: the size and design of letters were restricted by that of the machine, and a solid line of type was felt by purists to be less clear in impression than one made up of separate characters. The "Monotype" machine solved the second of these problems by casting each letter separately, but it, too, was restricted in type design. It was followed by other machines like the "Intertype" and the "Typograph". Nowadays the Linotype and Monotype machines are used extensively—the former for magazines and newspapers, the latter for books—though in the United States the improved Linotype has pride of place for almost everything.

The hand compositor, though much of his work has been taken

from him, is a man of importance. He may not be able to compete when a large quantity of letterpress is to be set in one size of type—but he has the advantage over a machine when several sizes are being used. Nowadays, with the advertising industry using an ever-increasing amount of “display printing”, there is far more of this work being done. The hand compositor is also responsible for title-pages, chapter-headings, arranging the machine-set type into columns and pages.

In England, printing arrived with William Caxton in 1476, twenty years after Gutenberg's Bible. Caxton was born in about 1422, in Kent, and was apprenticed to a silk merchant: the man died when he was nineteen and he was sent to Bruges to finish his term. When this was over he decided that there would be better opportunities of getting rich on the Continent than in England, and he settled there. Within a few years he had risen to the comparatively dizzy height of Commercial Adviser to a Duchess, and it was in 1472, during a business trip on her behalf to Cologne, that he began to study the art of printing. Two years later he resigned his post and set up as a printer in Bruges. After another two years he had printed his first book, his own translation of a French romance into English, which he followed by *The Game and Playe of Chesse*. His fame having travelled back to his native land, he decided to follow it.

The first book Caxton published in England was Lord Rivers's *The Dictes or Sayengis of the Phylosophers*, in 1477. Between this and the end of his life he published over eighty books, many of them being his own translations from the French. By 1481 he had produced a beautifully illustrated *Myrrour of the World* with his own woodcuts. His chief claim to fame rests on the fact that he brought literary masterpieces to all who could read and thereby preserved them for us. He printed Chaucer's *Canterbury Tales* twice, and a number of other works which have survived and it was not until he had done so that the English language began to settle down to a uniform spelling, punctuation and grammar.

Printing, one of mankind's greatest discoveries, has progressed a long way since the time of Gutenberg and Caxton. A certain amount of it is now done by photographic methods—printing a whole page from the equivalent of a photographic negative—and the next step forward is likely to be the abandonment of type altogether and the composition and printing of books entirely by photograph. But whatever developments take place, we can be sure that they will not have the sweeping significance of Gutenberg's work in the fifteenth century.

## *The Sacking of Constantinople*

### *A Direct Cause of the Rebirth of Learning in Europe*

THE RENAISSANCE was the whole process whereby Europe passed from a medieval to a modern civilization: "the fructifying of the human mind through contact with the classical world of Greece and Rome." It was the "rebirth of learning", and especially the study of Greek, which first weakened the rigid conventions of the Middle Ages. In consequence, though such a change as the Renaissance represents cannot be accurately dated, the fall of Constantinople in 1453 can be taken as one of the major, if not the decisive, events marking the transition between the ancient and the modern worlds.

How did Constantinople come to achieve such significance?

By A.D. 270 the once-great Empire of Rome was ready to crumble away owing to internal weakness and dissensions, and the formidable assaults of the Germanic tribes. The final dissolution was prevented, however, by the Emperor Diocletian, at least for the time being.

Diocletian was the greatest political organizer Rome ever had after Augustus. He tried to reconstitute all the imperial institutions in such a manner as to remove a number of sores which were threatening to destroy the body politic. Under his reorganization the Empire was divided into two spheres, an Eastern and a Western.

His successor was Constantine the Great, who, having officially accepted Christianity, deprived Rome of its eminence, and made the new capital of the Empire the famous old Greek city of Byzantium, which he renamed Constantinople, after himself.

This ancient city on the Bosphorus was reconstructed, and in A.D. 330 was solemnly dedicated to the Virgin Mary. It was Constantine's ambition to make his city worthy to be the capital of the Empire, and with that in mind he seized all the art treasures in the principal cities of Greece for its embellishment.

Whereas Byzantium covered only two hills, Constantine's new city occupied five, and when two more were added a century after his death, Constantinople, like Rome, stood on seven hills.

In 413 this enlarged city was surrounded by a high, fortified wall about thirteen miles long, as the main defence against the barbarians. For a thousand years, Constantinople, more fortunate than Rome, resisted the Goths and bought off the Huns; Belisarius saved it from the Bulgarians; it withstood the Persians for ten years; and it saw the famous Caliph Haroun al-Raschid retire from its walls.

Indeed the city might have claimed impregnability had it not been taken by the Crusaders in 1203, under Baldwin of Flanders. They marred a remarkable military exploit by so ruthlessly sacking the place that many of the choicest specimens of the art of ancient Greece were lost for ever. The Venetians alone showed good taste by carrying off the Horses of Lysippus to decorate their great Cathedral of St Mark's in Venice, where they can still be seen.

The direct consequence of this capture of Constantinople was the establishment of a family of Latin emperors. This family, however, ruled for little more than half a century, and in 1261 the Greeks were restored to the Imperial throne in the person of Michael Palaeologus. It was a descendant of this Michael who, under the title of Constantine XI, nearly two hundred years later, by his failure to defend the city from the Turks, became the last Roman Emperor.

Under the Palaeologus family the city had been restored to much of its outward glory. Proud of their capital in its unique setting, the Palaeologi all added to the magnificence of its buildings and tried by every means to make it otherwise a worthy centre of empire. Scholars were encouraged to settle there, and to attract them a great library, the special pride of successive emperors, was established. By the end of the fourteenth century, Constantinople had become the world's centre of learning.

Simultaneously with Rome's decline and fall a new power rose on its eastern borders. In 1307 Othman, the ruler of a relatively unimportant Turkish tribe, founded a small state and declared its independence. His successor, Orkhan, extended the boundaries of his state to the shores of the Sea of Marmara.

By the end of the fourteenth century this Ottoman kingdom, as it had become known after its founder Othman, had spread its domain into Europe, and was well on its way to becoming a world power when its progress was halted by the sanguinary invasion of the Tartar warrior, Tamerlane the Great, in 1402. It was only a temporary halt, however.

Mohammed I, who came to the throne in 1413, by constant warfare recovered the territories lost by his father, and passed on

his ambitions to his son, Mohammed II, who was to become known as El Fatyh—the Conqueror.

Mohammed II was a young man of twenty-one when he succeeded in 1451, three years after the accession of Constantine XI to the Imperial throne of Rome. After very rapidly establishing his position at home, by marrying his widowed mother to a slave and having his brother drowned, thus removing any possible counter-claimants, he turned his attention to executing the expansionist plans of his predecessors.

Ever since the conversion of the Turkish tribes to Islam in the tenth century the presence of a great Christian city and empire on the borders of their territory had been a constant thorn in the flesh of successive Sultans. As the capital of this Christian empire, Constantinople, besides the attraction of its great beauty and wealth, became a major target of the hatred of the Moslem Turks for the infidels. Not only that, Constantinople's position at the meeting point of the two great cultures of the East and West made it a place of the greatest importance to a power seeking to expand its influence into Europe. Several of Mohammed's predecessors had made attempts to capture it. He was determined to succeed where they had failed.

Within a year of becoming Sultan, Mohammed began to lay his plans. One of his first actions was to build a strong castle five miles from Constantinople, commanding the narrowest part of the straits of the Bosphorus. Seeing the danger which this represented, Constantine at once declared war on Mohammed.

Unfortunately, the Greek inhabitants of Constantinople, deeply occupied in disputing with each other and with the Christians of Rome and western Europe about unimportant details of religious doctrine, did not see the threat so clearly as their emperor saw it, and rallied to his warnings only with lukewarm enthusiasm.

When Constantine called for help, his natural friends and commercial allies, Genoa and Venice, were too intent on building up their trading relations with the Turks to wish to intervene; and the other Christian peoples of Europe showed an indifference to Constantine's predicament which can only be termed extraordinary.

The defences of Constantinople were very strong, and the only way in which the city, which had stood impregnable for centuries, might be captured was by siege, and starvation; and this method of reduction, so it was thought, was bound to entail many months, perhaps even years, of patient waiting on both sides, with the situation of the inhabitants becoming progressively grimmer.

The city occupied a triangular peninsula with the apex due east, and the base on the landward side, facing due west. The southern side, so precipitous that attack here was out of the question, was washed by the Sea of Marmara, the northern by the Golden Horn, a comparatively narrow but deep inlet of the Bosphorus.

To these natural defences successive Roman emperors had added formidable fortifications. These consisted of a moat over 60 feet wide and 20 feet deep, running under a low battlemented wall some 7 feet high, which made good cover for archers.

Twenty yards behind this wall was the main outer wall, 27 feet high, intersected by 96 towers at intervals of 60 yards, about 35 feet high and obtruding from the wall so that the whole wall might be effectively covered with fire.

Behind this wall was a 60-foot-broad covered-way, which separated the outer wall from the inner defensive wall. This wall was 30 feet above the covered-way, and into it were let 60-foot towers, double the size of those in the outer wall, so placed that they covered the intervals between the towers in that wall.

On the westward side the wall was pierced by 9 gates, and provided the enemy did not divert it, a stream flowed under the wall through the city to the sea on the south, thus assuring a supply of fresh water. In the Golden Horn Constantine had a fleet of 9 galleons and 30 smaller ships. To prevent Mohammed's ships from entering, a huge chain was stretched across the entrance to the inlet. These galleons could add their fire-power to that of the defenders inside the city.

Constantinople had a population of 100,000, but out of this number Constantine could find only 5,000 willing to fight for the city's defence. He had, however, 3,000 mercenaries, Genoese, Venetians and Cretans. Against this relatively puny force, commanded by a Genoese, Giovanni Giustiniani, the Turks brought up an army 160,000 strong.

The Sultans had for many years been guarded by a body of men comparable with the Roman Praetorian Guard, who were élite soldiers responsible for the protection of the Emperor's person. These Turkish troops, called Janissaries, were, however, selected on quite a different basis from the Praetorians. The Sultans seized the fifth son from all Christian families in their realms who had this number of sons or more, and trained them from early boyhood in athletic and moral accomplishments. They represented the cream of all Mohammed's armies, and indeed were unequalled by any other fighting men in Europe at this time.

By 5 April, 1453, Mohammed had completed his preparations, and he ordered his armies to approach the city. He pitched his red and gold pavilion outside the walls not far from the Golden Horn. Fourteen batteries of heavy guns were dragged into position, and to the accompaniment of prayers, shouts and the beating of drums the siege began with what was probably the first genuine bombardment in history.

Despite the thickness of the walls, they were unable to withstand the assault, and were soon breached in several places. Unfortunately for the defenders, the moat had run dry, and Mohammed ordered it to be filled in with the rubble from the walls. This was done under the defenders' fire. At the same time the latter erected stockades inside the walls opposite the gaps.

This work was completed in ten days, and on 15 April the Sultan ordered his infantry to attack at sunset. In the last glowing rays of the dying sun, the Turks threw themselves through the gaps in the walls. Within a short time the moat was filled in with the bodies of dead and wounded under the fire from Giustiniani's arrows and catapults. But though the Turks made the most determined efforts to set fire to the stockades and force a way through the outer defences, the little body of Constantinople's defenders held them off, and by degrees the battle waned and then ceased.

Nor was this Mohammed's only setback. He had ordered his own ships to assault Constantine's fleet in the Golden Horn, so that the city might be entirely surrounded, and the supporting fire from the galleons, which was proving very effective on behalf of the defenders, put out of action. These attacks, too, failed, and despite ingenious redispositions of his artillery the ships appeared as impregnable as the city.

A few days later, the arrival of three Genoese warships and a grain ship, bringing reinforcements and supplies to the beleaguered city, drew the Turkish fleet once more into action. And once more Mohammed's ships were unsuccessful and all four Genoese ships reached the safety of the Golden Horn.

Mohammed now became convinced that until he had put the galleons in the Golden Horn out of action he would not be able to take the city by assault or to starve it into submission. Since he could not sail his ships into the Golden Horn, he would have them taken overland and take the Roman galleons in the rear, a plan which reveals both the Sultan's resource and his ruthlessness.

First he had a track of wooden sleepers laid down, ten miles in length, from the Bosphorus to the river which ran into the Golden

Horn from the north. When this was completed, he had the ships hauled up out of the sea and placed in cradles. The track was then well greased, and the ships in their cradles glided along it with comparative ease.

The operation was hidden from the defenders of Constantinople by the houses of the suburb of Galata on the northern shore of the Golden Horn. To cover the noise, a constant bombardment was kept up. The operation was completed within three days, and on the morning of 23 April both the defenders and the crews of the ships looked out across the Golden Horn unable to believe their eyes, for there, gently swaying on the calm waters westward of the Roman fleet, was the Turkish fleet.

The Turks attacked immediately but were driven off. Giustiniani then ordered his largest ships to place themselves between the Turkish fleet and the northern walls of the city to ward off any possible attack in that quarter. Mohammed re-disposed his artillery so that these ships were brought within the range of his guns, and when one galleon was sunk, Giustiniani withdrew the rest.

To strengthen his position still further, Mohammed built a pontoon bridge across the upper end of the Golden Horn. Two thousand feet long with an eight-foot-wide road supported on barrels, this bridge brought the whole of the Turkish army and navy in touch. Constantinople was now completely surrounded.

On 29 May, Mohammed launched his final assault. In many hours of bitter fighting Giustiniani's meagre forces fought off attack after attack, and seeing that he was making no headway at all, Mohammed decided to bring up the Janissaries, whom he had intended to keep in readiness until the ordinary infantry breached the walls, and then throw them in for the final, decisive phase.

Mohammed placed himself at their head, and led them into the ditch. But even these élite troops could not overcome Giustiniani's eight thousand.

Just as Mohammed was furiously considering calling off the assault, Giustiniani was mortally wounded by an arrow. As soon as the news spread, panic seized his men, and they began to leave the walls, thinking only of escape.

At the first relaxation of the opposition, the Janissaries made a renewed attack, and this time gained a foothold within the city's defences.

Constantine made a determined and courageous effort to rally his men, and in person led the counter-attack, but as he went forward he, too, was killed. Without a leader, the defenders broke,



#### THE SACKING OF CONSTANTINOPLE

and Mohammed's troops poured in through the gaps in the walls.

For three days the pillage and slaughter raged, and when it was over, Constantinople was firmly in Turkish hands, and has remained so ever since.

Though thousands were killed, and thousands more were sent into slavery, a number of the scholars of Constantinople did manage to escape. Many made their way to Rome, where their arrival infused new life into the ranks of scholarship and literature. As many more wandered about Europe kindling an interest in learning wherever they went.

It was inevitable that under these invigorating influences there should be a revival in learning in the West. Though it is not possible to maintain that the sack of Constantinople was solely responsible for the Renaissance, it was certainly one of the major contributing factors.

## *Columbus Discovers the New World*

### *Europeans Enter Another Hemisphere*

IN THE vocabulary of the maritime explorers of the fifteenth century there was one word of particular significance: *Antilha*. Though there is some difference of opinion among scholars about the derivation of the word, it was probably a compound Portuguese word meaning "island in the distance".

Year in, year out, Portuguese seamen sailed from Lisbon to search the seas beyond the Azores for *Antilha*. In 1486, King John made to one of his lords a grant of *Antilha* for his own use, provided he discovered it within two years. In the documents drawn up, it was described as "a great isle, or isles, or continental coast".

It was not considered to be part of the Asiatic mainland, but a land-mass halfway between Europe and Asia, which would make it a most valuable staging-post when the route from west to east had been discovered. This being so, the finding of it represented the first step in the achievement of the western passage.

By the middle of the fifteenth century geographical knowledge had completely revealed the Old World to Europeans with one or two exceptions. These included the north and north-eastern coasts of Europe and Asia from Norway's North Cape as far as northern China, and including North Russia and Siberia; and the shape of South-east Africa, though the former could be fairly accurately deduced, and Bartolomeo Diaz was to reveal the other by his discovery of the Cape of Good Hope before the century closed.

The main preoccupation of the maritime explorers of this great period of the Age of Discovery was the finding of a route to the east via the west. The Portuguese were not the only searchers. With the same persistence with which their seamen set out from Lisbon in search of *Antilha*, English seamen sailed from Bristol, taking a more northerly route. John Cabot, who reached Labrador and Newfoundland, passing by or near to Iceland, sailed with the object of finding "Brazil island", his conception of the halfway staging-post between West and East.

There was among the sailors of the King of Portugal, however, a

certain Columbus who did not regard the discovery of Antilha in the same light as his contemporaries. He believed that the reason why no land had been found by the many explorers was because they were obsessed by the concept of Antilha. When they sailed far to the west without sighting land, sooner or later they began to believe that they had passed Antilha by unseen, and thereupon they would turn about, perhaps changing course a little to the northward or southward, but still without result.

This led him to the conviction that if any discovery at all was to be made, the idea of Antilha and Brazil must be abandoned and it must be assumed that no land lay between Europe and Asia. This meant that there was nothing that an explorer could do but cross the Atlantic on as direct a course as possible for Asia.

Since there was no means of knowing how great the distance was that separated the two continents, any expedition based on this hypothesis must be prepared for a voyage of twelve months at least. The cost of financing and equipping such a voyage would be considerable.

Christopher Columbus and his brother Bartholomew had been born in Genoa, one of the great maritime powers of Europe. Both, however, as very young men had made their way to Portugal and enlisted in the service of the king of Portugal. Christopher took a Portuguese wife, and if either of them thought of nationality at all, both regarded themselves as citizens of their adopted country.

Christopher had found regular employment on the run to Portuguese Guinea, and he had also made voyages to Bristol, from where he had once embarked on an expedition to Iceland. Of all Portuguese sailors, therefore, he was familiar with the navigation of the Atlantic from the Arctic circle to the equator.

When he had become seized with the idea of an expedition to discover a west-east sea-route direct to Asia, it was natural that he should turn first for patronage and aid to the Portuguese monarch. By this time, however, Diaz had discovered the Cape of Good Hope, and though the pursuit of a route via the Cape was for the time being in abeyance, there was no one who did not accept its subsequent opening as inevitable.

The opening of such a route would give the Portuguese a virtual monopoly of trade by sea with the East, for the route could easily be defended against intruders. Besides, the results of expeditions that had already made the attempt to find a transatlantic route all seemed to point to the fact that even if such a route were discovered, the distance would be so great as to make it uneconomical. The King

of Portugal, therefore, declined the honour of underwriting Columbus's venture.

Undaunted, Columbus next turned to Genoa, his birthplace, and when he met the same arguments and a similar refusal there and in Venice—whose interests were to preserve the overland route—he sent his brother to England to seek the aid of Henry VII, while he approached Ferdinand and Isabella of Castile.

Columbus's idea of approaching England and Castile simultaneously was to make capital of the rivalry which existed between the two countries. He would play off one against the other.

However, accidents, delays and circumstances of one kind or another hampered both his own and Bartholomew's negotiations, but by degrees he began to win over the rulers of Castile. At the same time Bartholomew made progress with Henry, and when at last he sent a message to Christopher summoning him urgently to a conference in London, Christopher had to reply that shortly before the message arrived he had virtually committed himself to Ferdinand and Isabella.

The news that Henry was interested clinched the matter with the Castilian monarchs, and on 17 April, 1492, signatures were set to a contract which gave Columbus not only the customary privileges accorded in such undertakings, but the additional personal rewards of the dignity of Admiral of Castile and Viceroy of any islands and continental provinces to which he would lay claim on behalf of Ferdinand and Isabella.

The preparations for the voyage were immediately put in hand, and on 3 August he set sail from Palos. Making first for the Canaries, he left the roadstead of Gomera on 6 September, in his flagship the *Santa Maria*, a vessel of 120 tons, and accompanied by the *Pinta* and the *Nina*, both of which were smaller.

Initially making little headway on account of feeble and contrary winds, on the third day out the convoy had some good fortune, for the winds veered to favourable and became fresh. This, however, did not entirely solve his difficulties, for his crews displayed signs of emotional upset.

In the biography of Columbus, allegedly written by his natural son Ferdinand, the author describes how, having "completely lost sight of land, many sighed and wept for fear that they would not see it again for a long time. The Admiral comforted them with great promises of lands and riches. To sustain their hope and dispel their fears of a long voyage he decided to reckon less leagues than they actually made, telling them they had covered only fifteen

leagues that day when they had actually covered eighteen. He did this that they might not think themselves so great a distance from Spain as they really were, but for himself he kept a secret accurate reckoning."

At midnight on 13 September, by which time the expedition had run six hundred miles to the westward, an interesting and important discovery was made. The compass needles were found to vary half a point to the north-west, and on the following morning a little more than half a point to the north-east. From this Columbus concluded "that the needle did not point to the north star, but to some other fixed and invisible point. No one had ever noticed this variation before, so he had good reason to be surprised by it." Three days later, and four hundred and fifty miles farther on, he was even more surprised to find at midnight that the needles varied a whole point to the north-west, while in the morning they again pointed directly to the pole star.

On 18 September, the *Pinta*, which had gone on ahead, for she was very fast, lay to and waited for the *Santa Maria* to come up. Her captain then reported to the Admiral that that morning he had seen a great flight of birds moving westward, and took this as a sign that land was near. In fact land was sighted at sundown some forty-five miles to the north, but Columbus refused requests to search in that direction, because it was not the place where his calculations made him expect to find land.

So the three caravels ran on before the wind, and as each day passed the sailors grew more and more frightened and disgruntled by being so long without sighting land. They held meetings in the holds of the ships, and were convinced that the Admiral in his mad fantasy proposed to make himself a lord at the cost of their lives. They had already tempted fortune as much as their duty required, so why should they work their own ruin by going further, especially as provisions were beginning to run short.

The grumbling and plotting went on day after day, until at last Columbus decided that he must take note of it. So he assembled them on deck, spoke to them sharply and threatened to punish severely any who prevented him from carrying out his plans. Somehow he managed to quieten their fears, and to bolster their morale he reminded them of the reward which the first to sight land was to receive.

There were one or two false alarms; what looked like land in the distance turned out to be storm clouds. This did not help matters at all, and by 10 October the anxiety of the crews and their desire

to sight land had reached such a pitch that no sign that they were approaching land—of which there were now many—would satisfy them.

On the following day, however, there were clear indications that that land could not be far off. First the flagship's crew saw a green branch float by near to the ship, and within a short time the crew of the *Pinta* fished out of the water a finely carved stick, while the *Nina's* crew saw other signs of the same kind.

"These signs," writes Ferdinand Columbus, "and his own reasoning, convinced the Admiral that land must be near. That night, therefore, after they had sung the Hail Mary as seamen are accustomed to do at nightfall, he spoke to the men of the favour Our Lord had shown them by leading them so safely and prosperously with fair winds and a clear course, and by comforting them with signs that daily grew more abundant. And he prayed them to be very watchful that night, reminding them that in the first article of the instructions issued to each ship at the Canaries he had given orders to do no night-sailing after reaching a point seven hundred leagues (2,100 miles) from those islands, but that the great desire of all to see land had decided him to sail on that night. They must make amends for this temerity by keeping a sharp look out, for he was most confident that land was near; and to whomsoever sighted it first he would give a velvet doublet in addition to the annuity of 10,000 maravedis for life, that their Highnesses had promised."

About two hours before midnight, as Columbus stood on the bow deck, he saw a light, but it was so uncertain that he did not dare to announce it as land. He called to him Pedro, the King's butler, and asked him if he saw the light, and when he said that he did, they called Rodrigo Sanchez of Segovia to have a look, but he took such a time that when he arrived it was too late.

They held on their course, and about two o'clock in the morning the *Pinta*, which was in her usual position ahead, fired the signal indicating that land had been sighted. A sailor named Rodrigo de Triana first sighted it when the *Pinta* was still six miles off. Triana, however, did not receive the reward, but Columbus, who had first seen the light.

The remainder of the night was spent impatiently awaiting the coming of the day, and when at last dawn broke they saw an island about forty-five miles long, "very level, full of green trees and abounding in springs, with a large lake in the middle, and inhabited by a multitude of people who hastened to the shore, astounded and marvelling at the sight of the ships, which they took for animals".

Both the islanders and the sailors were anxious to know what manner of men each was. Their desire was soon satisfied, for as soon as anchor had been dropped, Columbus went ashore with an armed boat, displaying the royal standard of Castile. Alongside him went the captains of the other two ships, each carrying the banner of the expedition, on which were depicted a green cross with an F on one side, and crowns in honour of Ferdinand and Isabella on the other.

Arrived on land, they knelt, kissed the ground and recited a prayer of thanksgiving. This done, the Admiral stood up and announced that he named the place San Salvador, and claimed possession of it in the name of "the Catholic Sovereigns with appropriate ceremony and words".

Thus the first Europeans put foot in the New World. They had reached the Bahamas, and the spot where they first made the shore has been commonly identified as Watling Island, which in 1926 was officially renamed San Salvador. The inhabitants, a mild folk, received the visitors very hospitably.

After a brief stay, Columbus explored some of the other islands in the group, including Cuba, where his flagship was wrecked. Leaving forty of his crew to garrison the island of Española, afterwards known as San Domingo, he returned to Spain with two ships, reaching there on 15 March, 1493.

Satisfied that he had reached the eastern extremity of Asia, and bringing products of the New World, Columbus was received with acclamation at the Court. Later in the same year he returned with a larger fleet and fifteen hundred men to what was henceforward to be known as the West Indies.

He made two other voyages after this, but none increased his knowledge of the New World much, except that on his last voyage he touched the coast of South America. He proved an inefficient Governor, however, and in 1500 he was recalled to Spain. He made one last voyage in 1502, and in 1506 he died, still ignorant of the great continent that lay between his discoveries and the Asia he sought.

## *The Sea-Route to India*

### *Vasco da Gama Transforms the Commerce of the World*

THE TWELFTH, thirteenth, fourteenth and fifteenth centuries were an Age of Discovery, the fifteenth marking its greatest development and the final decade of the century, its final stage, consequent upon the discovery of America.

It was an Age of Discovery in a much wider sense than is represented by the activities of European travellers to new places and among new peoples. It saw the rise and development of Gothic architecture; the beginnings of modern painting and sculpture, and music; the institution of universities; the revival of Greek philosophy and Roman law; and the earliest movements towards a freedom of thought in religion which was to reach fruition in the Reformation.

All these movements were signs of an increased vigour in Roman Christianity, and though the connexion may not be readily perceived at first sight, it was this same upsurge of renewed vitality which stimulated geographical discovery. The relationship between Christianity and the discovery of new lands and peoples was formed in this way.

The Christian Church, in its new strength, turned its energies once more to the work of conversion. Various religious and military Orders came into being dedicated to carrying out the missionary rôle of the Church. By the end of the tenth century, the Scandinavian peoples, the Poles and the Hungarians had all been partly converted; by the end of the eleventh, the Pomeranians, the Finns and the Estonians; while during the twelfth, the Russians had been Christianized by the Greek Church, and the followers of the heretical Nestorius had carried their particular brand of Christianity to Central Asia, where they are said to have converted a powerful ruler, who became a priest and whose fame spread throughout western Christendom as Presbyter, or Prester, John.

Side by side with these missionary endeavours, traders and secular travellers had pushed their activities farther and farther afield, until the Far East was brought into contact with Europe. The experiences



of the Venetian adventurer, Marco Polo, led him to compile a handbook to the East for the use of European visitors.

While these inland discoveries were being made in Northern Europe, Central Asia and the Far East, at the same time a similar process was developing in the south, where the Mediterranean divided the Christian world from the Moslem world of North Africa.

Here, however, it was a reverse of the process, for, under the stimulus of fanatical missionary zeal, the Arabs of Islam were attempting, with some measure of success, to bring the benefits of their religion—and rule—to Europe.

The greater part of Spain fell into their hands, and though their invasion of France failed, they seized Corsica, Sardinia and the Balearic Islands. They represented the dominant maritime power in the Mediterranean, and for several decades held in check the rising sea-power of Venice and Genoa.

In addition, as well as dominating the Red Sea area and East Africa as far south as Madagascar without rivals, the Arabs carried on an extensive caravan trade across the Sahara with the negro tribes of the Sudan. They were aware, too, that the great barren Atlantic coast of the Sahara terminated in a fertile tract watered by the River Senegal, for on a map constructed by an Arab cartographer in 1150 the territory was named *Bilad Ghana*—Land of Wealth.

It is improbable that they were in regular contact with Bilad Ghana. On the other hand, the Italians and the Portuguese, excluded from overland trading with Africa, saw in Bilad Ghana an outlet for their interests which was at the same time accessible—by sea. Thus the important events of the Maritime Age of Discovery begin on the coast of the Atlantic margin of the Sahara, with expeditions first by the Genoese in the thirteenth and fourteenth centuries and by the Portuguese in the first half of the fifteenth.

To trace the rise of Portugal to a first-class maritime power, it is necessary to go back to first events. As we have seen, in the tenth century the greater part of the Spanish peninsula was in the hands of the Moors, as the North African Arabs were called. By the second half of the following century the Moors had been driven south, and the lands as far as the River Tagus had been recovered for Christianity. In 1094, Alfonso VI of Castile, who had most successfully fought the Moors, bestowed the recently annexed province called Porto Callo, or Portugal, upon his son-in-law, Henry of Burgundy.

Henry's son, Alfonso I of Portugal, carried on the war against

the Moors, extended his territory, captured Lisbon and assumed the title of King instead of Count, and after a famous victory over the Moors at Ourique in 1139, won Castilian recognition of Portugal's independent status.

The small independent kingdom of Portugal continued to wage war on the Moors successfully, and to prosper under a line of monarchs who, besides fighting vigorously, did not neglect the welfare of their people.

During the reign of Alfonso III (1248-1279) Portugal was extended to what were virtually permanent limits. Though his successor Diniz is regarded as the founder of Portugal's commercial and industrial activities, the war with the Moors and the struggle to resist the domination of later Castilian rulers were the chief occupation of his son, Alfonso IV—the Brave.

The struggle with Castile was finally resolved by the brilliant Portuguese victory at Aljubarrota on 14 April, 1385, in the reign of John I, whose queen was Philippa, daughter of John of Gaunt.

John I, who reigned for nearly half a century, laid the foundations of the Portuguese maritime empire, his chief assistant in the enterprise being his younger son, Prince Henry the Navigator. It was under Prince Henry's direction that expedition after expedition sailed from the shores of Portugal, discovered the Canaries and the Azores, and crept round the great western shoulder of Africa, eventually reaching Bilad Ghana.

It was Henry's plan to form a Greater Portugal by adding the Land of Wealth to the colonies of the Canaries and Azores; but it was a plan which involved a considerable financial outlay that had to be compensated by making a pecuniary profit, and this he hoped to do by trading in slaves.

For some years he failed in his attempts to capture any negroes at all. By degrees, however, he achieved more success and slowly built up a profitable commerce in slaves. But it was the searches of Henry's slave-merchants that took his ships farther and farther south, down the West African coast, until by 1446 Cape Verde was reached and passed, and the coast of what is now Portuguese Guinea was explored.

The riches in ivory and gold which Portuguese Guinea produced encouraged further explorations, though it is doubtful whether these had extended much farther southward by the time Henry died in 1460. But the Portuguese had by now become commercially minded which made it both natural and inevitable that further sources of trade should be continually sought.

Within twenty-six years of Henry's death three times the length of coast had been explored than during his lifetime, and Portuguese sailors had come within measurable distance of India, China and the Spice Islands. Europe's trade with the East seemed to be within the grasp of Portugal.

As the African coast was progressively explored by the Portuguese and set down on charts, it began to occur to some that the realization of the idea of reaching the East by way of the West was merely a matter of effect. In 1474, a canon of Lisbon, while on a visit to Florence, consulted Toscanelli, the most eminent of Italian physicists, as to the feasibility of such a scheme, and brought back to Alfonso V a favourable opinion.

Twelve years were to elapse, however, before the breakthrough was achieved. In 1486, Bartolomeo Diaz set sail with two ships, and after a few months spent on the Gold Coast he sailed on south, and as the months passed, he went further south than any explorer before him, until early in May, while still following the coastline, he found that instead of being on a southerly course he was now sailing east, and realized that he had reached the southernmost point of Africa. He first named the place the Cape of Storms; but later, in consultation with the king, he changed it to the Cape of Good Hope.

There now appeared on the scene another sailor who was to achieve immortality by his discoveries. Christopher Columbus, though by birth a Genoese, had joined the Portuguese Navy as a youth and had taken a Portuguese wife. He had had no difficulty in finding regular employment on voyages to Guinea, and he had also sailed to Bristol and from Bristol far beyond Iceland. These experiences gave him a knowledge of Atlantic navigation from the Arctic circle to the equator.

Fired by the enthusiasms of his times, he conceived several plans of his own. These, however, were so extreme in their proposals that he could persuade no patron to give him the necessary support. But he was a persistent man, and coincidental with Diaz's return from his discovery of the Cape of Good Hope, he had won the support of the Castilian monarchs, Ferdinand and Isabella.

Under their patronage he made two voyages, the first in 1492, when he discovered the Bahamas, and the second in the following year, on which he visited Cuba and Haiti, and gained a general notion of the West Indian archipelago. The success of these two voyages awoke the Portuguese to the realization that now, if at all, they must press forward vigorously with their own project, and

once having taken the decision King Manuel lost no time in summoning to him another of his outstanding explorers, Vasco da Gama, and commissioning him to undertake the task of finding a sea-route to India via the Cape of Good Hope.

Leaving Lisbon on 8 July, 1497, da Gama made first for the Cape Verde Islands. From here he set out on 3 August and first sighted land again ninety-three days later, and on 8 November he anchored in the bay of St Helena. Here he paused for eight days, taking on wood and careening his ships.

On 16 November he continued his voyage, and six days later he rounded the Cape of Good Hope. Once more he anchored, and on 16 December he entered waters never before crossed by European vessels.

Sailing up the east coast of Africa, on Christmas Day he reached the roadstead which he named Port Natal. Making halts in the bay of Lourenço Marques and at the mouth of the Kiliman river, on 2 March, 1498, he hove-to in the roadstead of Mozambique.

From here his task was easy. He was now in waters which had been navigated for centuries by the Moslem Arabic-speaking seamen of Mozambique who received him well and agreed to supply him with pilots, who guided him to Mombasa. At Malindi he acquired new pilots who undertook to navigate him across the Indian Ocean to Calicut, now known as Calcutta. He anchored off Calcutta on 20 May, ten months and twelve days after leaving Lisbon.

Calcutta was the great centre of Arab trade, the chief among the many ports of the Malabar coast from which Europe drew its supplies of pepper, ginger, cinnamon and numerous other spices. The normal trade route was by sea to Jiddah in Arabia, from there to Tor, the port on the Sinai peninsula, and thence overland via Cairo to Alexandria, where European merchants had established themselves.

At all the stops *en route* duty had to be paid on all goods in transit. If direct contact with Calcutta could be established, despite the cost of the voyages, the Portuguese merchants, by avoiding these duties, would be able to undercut other European merchants and still make a handsome profit. In addition, however, the establishment of a sea-route to the East opened up possibilities of trade whose horizons were too distant to discern.

After escaping assassination at the hands of Moslem merchants in Calcutta, da Gama was eventually given permission to trade. On 29 August, 1498, he embarked on his return journey, and reached Lisbon in September of the following year. Besides the valuable

cargo he had acquired, he brought back with him detailed information of the coast of India as far as Bengal, and of Ceylon, Malacca and Sumatra.

This voyage of da Gama was the greatest feat of seamanship ever attempted. The discoverer of the New World had only to undertake a voyage of thirty-six days in which, with fair winds, to traverse 2,600 miles. Da Gama had to undertake a voyage nearly three times this distance and battle against contrary winds and uncharted currents.

But his greatest achievement lay in the fact that by opening up this route he transformed the commerce of the world.

## *Cortes Conquers Mexico*

### *The Wealth of the New World Enriches the Old*

COLUMBUS'S FEAT, in 1492, of joining two worlds—though one was not Asia as he claimed—had rung down the curtain on the Middle Ages. Behind it the stage was being set for the new era of modern history.

The year, a momentous one for all Europe, was particularly so for Spain, whose centuries-long struggle with the Moorish invaders had triumphantly ended with the fall of Granada, shortly before the three Spanish caravels had sailed from Cadiz. Flushed with victory, Spain felt itself the elect among nations.

Less than a score of years earlier the turbulence of rebellious barons had brought disorder and anarchy. From their castles they had waged private war against each other, preyed on trade, made the highways unsafe and defied the authority of the Crown. But when in 1478 Isabella of Castile ascended her throne, these recalcitrant subjects quickly learned that they had met their match in the mild but strong-willed woman, who with her husband, Ferdinand, King of Aragon, held sway over all Spain.

By strategy, guile and force of character she began to bring order out of chaos. Bribery, flattery, political bargains and a religious war against the remaining Moslems were the means she used to stimulate patriotism and national unity, and the discovery of America was most opportune in this process of consolidating her authority. Now, with comparative peace reigning throughout her realms, the New World offered an outlet for the tireless energy of leaders long accustomed to war, and for the restless ambition of second sons.

Thus it came about that many military expeditions, subsidized for the most part by their leaders, poured out of Spain. From the bridgeheads of Cuba and San Domingo, in the West Indies, they overran with their few thousands the vast territories of a continent.

Like most entrepreneurs then and since, these men, who were investing their fortunes and their lives in risky ventures, looked for quick returns and large dividends. Certainly they wanted gold, but they were equally keen to acquire social prestige which was

symbolized by landed estates amply supplied with serfs bound to them to extract the fruits of the earth for them.

The rapid emergence of Spain as one of the first modern nations had coincided with the realization that the inhabited world was a vaster space than ever dreamed of before. This sudden expansion of horizons to unbelievable dimensions, intellectual as well as physical, was now coupled for Spain with a sense of destiny as the appointed agent of God for the tremendous task of converting the whole world to Christianity. The final crushing of the Moors and the discovery of the New World were clear indications, in the Spanish view, of the special approval of Providence, and this conviction released a prodigious national energy and powerfully stimulated the imagination of youth.

An enormously enlarged world was crammed full with the possibilities for adventure, riches and romance, in which the wildest dreams and the fondest hopes of fame and fortune might be fulfilled. Life had a zest and an irresistible allure in the bright renaissance light that was swiftly shedding the medieval gloom. And as if the promises of reality were not enough, there was the additional stimulant of the "romances of literature" coming from the newly invented printing press.

These novels, under whose hypnotic influences all seemed to fall, from the lowliest clerks to the monarchs, resembled authentic chronicles of the exploits of knightly heroes in strange and enchanted lands. They presented a highly idealized concept of life in which strength, virtue and passion were all of a translucent and unnatural character, and they brought to over-receptive minds plausible accounts of fantastic places, riches and wonders that, so it seemed if the tales of travellers coming back from the farthest corners of the New World were to be credited, had their counterparts in reality. Young men burned to see and possess for themselves the marvels portrayed in these wonderful tales.

Scarcely did they disembark in the New World than they rushed inland in search of the elusive El Dorado, the Amazons with their golden tools, the Fountains of Youth, the Seven Enchanted Cities and other equally fabulous inventions of the literary mind. Many of them did not come back, and most of those who did had to confess that they had not found what they had been looking for. Yet, so strong was the desire that the failure merely encouraged others to try their fortune.

Among the Conquistadores, however, there was one who had more success than the rest. Born a younger son in a noble family

in 1485, after two years at the University of Salamanca, Hernando Cortes set out in 1504, at the age of nineteen, to seek adventure in the West Indies. For the next fourteen years adventures in plenty came his way, but he was no nearer to making his fortune at the end of them than he had been at the beginning.

At this time the Governor of Cuba was Don Diego Velasquez, a greedy and rapacious man, who was jealous of the wealth which some of the explorers of the Mexico coasts brought back from their expeditions. None, however, had excited him so much as the treasure acquired by a certain Juan de Grijalva, who set out with two hundred and forty men in 1518, and returned within a few months with more than "sixteen thousand pesos in jewels and low grade gold" which he had obtained by bartering knives and swords with the natives.

Since the risks had apparently been comparatively small and the rewards so great, Velasquez decided at once to despatch an expedition on his own account, and to lead it he appointed Hernando Cortes. By this time, Cortes had settled down in Cuba, was married to a beautiful wife, the daughter of a Spanish immigrant, and had become one of the wealthiest ranchers in the island. He seemed to have shed the urge for excitement in the many ventures in which he had been involved during his early twenties, and was content to live the quiet life of a comfortably well off don.

Nevertheless, when he heard Grijalva's account of the strange country to which he had come, of the stone statues which towered thirty or forty feet high, and the great white road he had seen disappearing into the far distance inland, it was this, rather than the gold, which excited his curiosity. It seemed clear to him that Grijalva had discovered some great new territory which should be explored for Spain without delay.

So rekindled was all his old spirit of adventure, so fired his imagination, that even when he learned that Don Diego was not intending to contribute a single peso himself to the cost of the expedition, but was requiring him to raise the necessary funds, Cortes cheerfully mortgaged his estates, borrowed more from local merchants and canvassed for volunteers to accompany him.

Soon he had collected more than two hundred men and six ships, and was busily engaged in provisioning the latter when word came to him that Don Diego had decided to remove him from command of the expedition. Friends of the Governor, jealous of the opportunity which it would give its leader to enrich himself, had persuaded Don Diego that Cortes, known to be so rash and impetuous in his



younger days, would either lead the venture to disaster and those who went with him to death, or he would not return, but set himself up wherever he found a suitable location, and keep the wealth he acquired for himself.

It was late at night when the news reached Cortes, and he decided to thwart Don Diego's designs by sailing immediately, though he still lacked half the men he had estimated he would need, and had only six of the eleven ships. So the men were rounded up out of their beds and summoned from the taverns, and by midnight were aboard. The ships, carried by the ebb tide, drifted towards the open sea, and when dawn came were standing off-shore, awaiting their commander. He was still in the town rounding up all the supplies of meat on which he could lay hands. This he had carried down to the ships' boats in the lightening day, and had just ordered them to be rowed out to the ships when Don Diego, who had been hastily awakened, arrived at the water's edge, roaring, "Is it thus you part from me?"

"Time is short, Excellency," Cortes called back. "Has your Excellency any last command for me?"

In his anger the Governor was speechless, and as he watched the little fleet weighed anchor and sailed away.

From Cuba, Cortes made first for Trinidad, where he planned to persuade more men to join him and to take on the provisions he still needed. While he was there Don Diego sent a letter to the mayor, ordering him to arrest Cortes and return him, bound, to Cuba. But when Cortes's men threatened to burn down the little town if a hand was laid on their commander, the mayor did not dare to act.

By the early weeks of 1519 all was ready, and on 10 February the expedition set sail. There were now eleven ships in the little fleet, comprised of one of a hundred tons, three of seventy tons and the remaining seven small fishing boats which offered no shelter from the weather. Into these ships Cortes had crowded four hundred and twenty men, sixteen horses, ten fair-sized cannon and four lighter guns. It was with this ridiculously puny force that this extraordinary Spaniard conquered Mexico for his king.

Running first to the island of Cozumel, where they stayed ten days, on 6 March, 1519, the fleet rounded Cape Catoche and swung westward, and keeping a mile off-shore they followed the coastline until they came to the mouth of a great river, which he recognized as that described by Grijalva, and thereby knew that he was on the right course. He attempted two or three landings on the coast, but

was driven off by unfriendly natives, and eventually came to the place where one of the veterans declared Grijalva had obtained the gold and jewels which had been the cause of the present expedition.

The man was mistaken, but on going ashore, he found the natives friendly, and here he learned, through the Aztec girl, subsequently named Marina by the men, who accompanied the expedition from now on as interpreter, that he had landed on the eastern shore of the Aztec empire. This vast territory stretched from the Atlantic westwards to the white shores of the Pacific. Its ruler was a powerful emperor called Montezuma, whose fabulous capital, Tenochtitlan, lay in a valley among the mountains, deep in the interior. This city Cortes decided at once that he must visit, and there attempt to persuade its emperor peacefully if possible, or if not by war, to accept the overlordship of the King of Spain, who henceforward he declared to be true ruler of this country.

Disaffection had by this time taken hold of some of his men, and to prevent them from deserting he ordered all the ships except one to be burned. On 15 August, Cortes placed himself at the head of his little band. Fourteen of them were mounted, and carried lances; thirty carried muskets and sixty had crossbows. The remainder were armed with swords and daggers.

After three days' marching, they emerged from the first mountains into a vast plain, dotted with farmhouses and ploughed fields, and as they went on it became clear to Cortes that these people were no savages, but men as civilized, though in a different pattern, as the Spaniards themselves. They appeared also to be friendly disposed, for often deputations would come to meet them, offering presents of gold and jewels and supplies.

The road, however, lay through the territory of a warlike tribe, the Tlascalans, who refused to submit to the authority even of Montezuma. Traversing this country, the Spaniards had to defend themselves; but their horses, like the Carthaginian elephants, played a large part, with the muskets and cannon, in the Spaniards' ultimate victory, for these were the first horses ever to be seen in these parts. And so they came to the Valley of Mexico, at the far end of which Montezuma's capital lay.

As they continued their way through the valley, they were again greeted by friendly people. On 8 November, 1519, having covered more than four hundred miles they came to the great city. Their defeat of the fierce Tlascalans had made a deep impression on Montezuma, who, in many years of attempting to subdue them,

had never been successful, and the emperor had decided to welcome the Spaniards.

The civilization which the Spaniards found in Tenochtitlan—which they now renamed Mexico—was something which they had never encountered before. What amazed them most was the vast wealth in gold and jewels which all the Aztecs appeared to possess, and the vast scale on which the houses and palaces were built. Three hundred men had successfully reached Mexico City, and were quartered in the palace of Montezuma, each man in his own room, and this without incommoding the Aztec population of the palace.

Before setting out from Vera Cruz—as Cortes had named the place where he had landed—he had decided to renounce the authority of the Governor of Cuba, and declare his direct allegiance to the King of Spain. The one ship which had not been burned, he had despatched to Spain to state his case.

News of what he had done reached Don Diego, who at once sent a second expedition to recall Cortes, who had scarcely had time to consolidate his position in Mexico City, when this expedition arrived at Vera Cruz. Leaving a number of his men in the city he set out with the rest for Vera Cruz to prevent the new expedition from marching inland. Arriving on the coast he was able to persuade the majority of the newcomers to join him; those who would not were sent back to Cuba.

He then marched back to Mexico City with his augmented force, and there found the men he had left behind in a very precarious position. In his absence, some of Montezuma's chieftains, angry at the submission of their emperor to the Spaniards, had gathered their forces and attacked the invaders. Realizing that he could not hold the city he withdrew.

For the greater part of a year the struggle continued; then on 14 August, 1521, Cortes launched his final attack on the city. The battle raged fiercely from noon to sunset and ended with the surrender of the Aztecs. At the age of thirty-six, Cortes found himself the effective ruler of the great empire, now recognized by its peoples and all others besides as a possession of the Spanish Crown, its first considerable possession in the New World.

It was an outstanding achievement, but it was marred by the extreme cruelty of Cortes towards his victims. He burned towns and villages in reprisal and slaughtered their inhabitants in a bloodbath scarcely equalled in history. Every Aztec leader who fell into his hands he burned at the stake; every prisoner he took he put to the sword; yet their only crime was that they had tried to defend their

country. He took the Aztec ruler Montezuma II prisoner and having promised to show him all the respect due to so great a monarch, on the flimsiest of excuses he murdered him and all his sons and daughters. Indeed, Cortes's excesses throughout his conquest of Mexico bestowed on him the continuing doubtful distinction of a place among the most ruthless and cruel military leaders the world has ever seen.

Administered from Madrid, the settlement of Mexico was carefully controlled. But it was the great treasure which it yielded, much of which the great Spanish galleons transferred to the Mother Country, which made Spain the dominant power in Europe for almost a century.

Never in modern history has any power so enhanced its position by the operations of so few men—Cortes's last army comprised fewer than a thousand men—nor at so little cost of life; nor acquired such vast portable wealth from one short campaign. But though the Spaniards themselves might go into a decline in Europe, with the conquest of Peru, by Pizarro, by the middle of the century, and later conquests, they firmly attached the whole of the South American continent to the Iberian peninsula. The mercurial temperaments of the Spaniards and Portuguese have made a firm impression on the lives and destinies of the Latin American peoples, and seem likely to continue to do so in the future.

## *Copernicus's Theory*

### *The Earth No Longer the Centre of the Universe*

NEAR THE high altar in the University Church of St Ann in the Polish city of Krakow there are two inscriptions. One of them, in Latin, says simply, "Nicholas Copernicus, the ornament, the honour and the glory of his country, his city and his university".

The other reads, in Polish—the language of Copernicus—

"Polskie wydalo go plemie  
Wstrzymal alonce, wzruszyl ziemie."

And this tells us why the name Copernicus is held in awe among scientists all over the world—though he died four hundred years ago. Freely translated, it reads,

"He asked the sun to stop. And when it did,  
The earth began to spin. Yet he is Poland's—  
Poland nourished him—"

From the earliest days men had looked at the sky and wondered. "In the beginning", says the Book of Genesis, "God created the heaven and the earth." And a little further on, "God made two great lights; the greater light to rule the day and the lesser light to rule the night: he made stars also. And God set them in the firmament of the heaven to give light upon the earth."

So that was the reason. But there were questions still unexplained. When man first blinked at the entrance to his cave, shielded his eyes from the rising sun in the east, he became aware that the sun moved. There was no doubt about it. Whether the thing was only a lamp held high by some invisible hand, whether it was a peep-hole in the sky, a puncture in the blue firmament, letting in light from some all-embracing heaven, or whether it was a god in a golden chariot—it moved.

At the start of its run, when it was near to the earth, when its golden shape, like an orange which has fallen from its tree into the water and rises slowly to the surface, was lifting above the horizon, one could see it moving. See, it was tangled in the branches of that tree: No, it was breaking loose, it was rising—it had cleared the

tree. It was on its own, moving slowly, definitely, into the sky. After this, one tended to lose interest, it was up there, somewhere, providing light for the tasks of the day, but unless one craned one's neck, one never saw it. Until evening. Then the sun sank, quite visibly, back into its pool of darkness—but at the other end of the horizon; it sank, not through the branches of the same tree, but in a different place.

And the next morning it rose again, not exactly in the same place. Unless someone had moved the tree in the night, the sun had moved its pathway a few inches. Now it rose, not through the branches, but beside them.

In the second century after Christ, the Greek astronomer Ptolemy produced his own theory. A little startling at first, but it needed only the testimony of the senses to make one realize that it must hold the only possible answer to the mystery of the skies. There is no doubt, said Ptolemy, that the earth is a huge lump of matter in the exact centre of the universe, at the centre of everything. The sun, the moon, the stars—all these revolve unceasingly around it. They change their positions, hour by hour—and this is the reason. We are the centre of the universe—everything goes round us.

It was plausible; it seemed, when one thought about it, absolutely unshakeable. And it was pleasantly flattering to man. Round and round went these heavenly bodies: and if it were not at man's bidding, at least it was on his behalf; shedding their different radiance to light his day, his night, point the way for his journeys to north, south, east or west.

This delightful theory met no successful opposition for fourteen hundred years.

Then, in February of 1473, Nicholas Copernicus was born in the Polish town of Torun, on the River Vistula. Nowadays it has thriving industries: there are engineering works, chemical works, textile factories. But it is famous for Copernicus. At the age of eighteen he went from there to the ancient Polish University of Krakow where he studied astronomy, under the Ptolemaic system. From Krakow he went to Italy, where he studied canon law, out of consideration for his uncle, Bishop Lucas, who wished to make him a priest: Copernicus had no intention of becoming a priest, but this was a courteous halfway measure.

He continued, at Bologna University, his studies of the sun and stars and, with them, mathematics. By the turn of the century, in 1500, we find him lecturing in Rome on both these subjects. He was fortunate in being able to observe an eclipse of the moon while

he was there. Then, for he was a man of parts, he went on to study medicine at the University of Padua—while finishing studies for his doctor's degree in canon law.

Now at the age of thirty-two he settled, as his uncle the Bishop had urged him to do, in the bishopric of Varmia, where he became his uncle's physician and personal secretary. He devoted a great deal of his time to healing the poor and dealing with the Bishop's correspondence, while at the same time he recruited and trained soldiers to resist the German "Knights of the Teutonic Order" who made periodic raids into Poland.

It was here, in Ermeland, in the intervals of fighting battles, healing the sick and administering church property, that Nicholas Copernicus found time to observe and tabulate the data which revolutionized man's thinking about the world and its neighbours. Shortly before he died in 1543—still working in Ermeland—his book *De Revolutionibus Orbium Coelestium* was published. It stated, quite clearly, that the earth was *not* the centre of things. The sun was the centre of a planetary system, had a number of smaller "planets" moving round it: and the earth was only one of these, and by no means the largest. Far from being stationary and central, the earth was in a huge "orbit", millions of miles from the sun, travelling at a great speed.

The theory was, in every sense, incredible. As Dr Dorothy Stimson says in her study of Copernicus and the gradual, painful acceptance of his idea: "It is a triumph of reason and imagination; and with its almost complete independence of authority, is perhaps as original a work as a human being may be expected to produce."

But the publication, long delayed, was a small tragedy. Copernicus, audacious as a thinker, physically brave, was timid over his theories. He was a good churchman and he sensed that the Church would take exception to this revolutionary theory "concerning the revolutions of the heavenly spheres". Who was Copernicus, indeed, to meddle with Heaven itself? He delayed for years, checking and rechecking data and calculations, before agreeing to publish the work. As he admits in his preface, explaining the delay: "The scorn which was to be feared on account of the novelty and absurdity of the opinion impelled me for that reason to set aside entirely the book already drawn up."

But he was an honest man and he refused to write—as he had been advised—an introduction explaining that the new system was merely a hypothesis, useful for calculations but not necessarily true. He was ageing fast, his eyes were growing dim, and thus he was unable to see, when the first copy appeared from the printer in

Nuremberg, that someone else, meaning well, no doubt, had written the introduction for him.

Because of this disarming foreword, the Church turned a blind eye, failed to realize the theory's significance, and only did so in 1616, many years after its author's death. Then, with much-belated haste, it put *De Revolutionibus* on its forbidden index, where it remained until 1835.

The Catholic Church, so slow to recognize the character of Copernicus's discovery, made no attempt to decry it, to persecute those who might be tempted to believe it—whereas the new religious reformers were less tolerant. Martin Luther made fiery speeches denouncing the mad Pole, "The New Astrologer, who would overturn the whole system of astronomy."

Luther was right: the theory *did* overturn astronomy, though it took more than a hundred and fifty years for it to be accepted in the Universities, and generations more before the common people were prepared to accept it.

The heliocentric theory—that the sun was the centre of our planetary system—was a complete departure from previous thinking on the subject, and although we accept it without question to-day, it is easy to see why it was regarded with fear, even horror. All the evidence of one's senses argues against it. But once it had been accepted it revolutionized scientific thinking.

Kepler, Galileo and others developed the theory until it was completed by Newton. Without it, Kepler would not have been able to discover the true form of the planetary orbits: the concept of universal gravitation (the well-known apple landing on Isaac Newton's head) would have been impossible without a heliocentric viewpoint. Without a realization that each heavenly body has its own gravity, depending on its mass, partially countered, for those who reside upon it, by the centrifugal force of that body's rotation, and that there is no gravity elsewhere, it is unlikely that anyone would, for example, have considered space travel: no satellite or projectile would be able to withstand a constant force of gravity.

Copernicus had ideas which extended far beyond what we now call the solar system, that system of planets, some with satellites around them, all moving round the sun: and we now know that the sun and its solar system are only a minute part of an infinite universe, with other, far larger, systems, revolving around other far larger stars. For the sun, as astronomers soon realized, is only a star, and an inferior one at that, around which we move, in orbit, at a distance of only 93,000,000 miles.



Most distances in space—from star to star, system to system—are far too vast to be expressed in this way; they have to be set out in “light years”. Light travels at 300,000,000 metres (or 186,000 miles) in every second of time. It takes, for example, eight and a half minutes to reach us from the sun; if the sun went out, it would be eight and a half minutes before we knew. The distance which light could travel in one year is obviously too vast to consider—but this is the astronomer’s yardstick—the “light year”. Many stars are millions of *light years* away from us; their light takes millions of years to reach us. We know, from calculation and conjecture, that in fact many stars and constellations which we see each night are simply not there—they vanished, burnt up, thousands, perhaps millions of years ago, but our descendants will be seeing them for a long time yet.

The theory of Copernicus was extended easily to explain the various seasons. The earth went round the sun, rotating as it did to give night and day, but it did so while tilted—and maintaining that tilt—at a little over twenty degrees, constantly pointing at some far-distant point in the universe. Because of this there would be a time in the earth’s annual orbit when the top, northern half would be pointed toward the sun, “leaning” towards it, which would be midsummer in the northern hemisphere. Six months later, when the earth had travelled to the other side of the sun, while remaining tilted in the same direction, it would be the bottom half of the globe which was tilted up towards the sun; it would be midsummer in the southern hemisphere.

Many other theories which had been only dimly considered before the time of Copernicus were suddenly found, on a helio-centric basis, to be perfectly sound. Even in our own century, the work of Albert Einstein, with his theory of Relativity which has opened up a new world of astronomy and physics, has done little to upset the basic theories of Copernicus.

During the wholesale destruction of Warsaw during the Second World War the famous statue of Copernicus was spared by the Germans, but the inscription below: “Nicholas Copernicus; his fellow-countrymen”, was altered to, “Nicholas Copernicus: the German Nation”, on the assumption that the great man could be regarded as a German. (His birthplace, Torun, was a part of East Prussia for many years—but only after his death.)

The inscription was changed back again after the war and Nicholas Copernicus remains one of Poland’s—and the world’s—greatest.

## *Martin Luther Inaugurates the Reformation*

### *The Split of Western Christendom*

BY THE beginning of the sixteenth century, opposition to the Church was growing to the proportions of a widespread revolt. Only a spark was required to set the sensitive tinder aflame; and in the event, the spark was to be kindled by an obscure German monk who split the Christian world in two.

The Church had brought its troubles on its own head. For several centuries the general immorality of the priesthood had caused revulsion among laymen, and among the more honest and Christian churchmen. From St Bernard at the beginning of the twelfth century to Bishop Fox, who founded Corpus Christi College at Oxford in 1516, every generation had produced distinguished men who had all advocated the most urgent reforms in terms that were unambiguous and could be at once fully understood.

The abuses were of all kinds: the acquisition of great wealth by corrupt means, the multiplication of holy days with their attendant orgies and riots, the sale of Indulgences by which a man might free himself from the responsibility of his sins by the payment of money, the immunity of the clergy from the secular laws, which made it possible for unscrupulous priests to commit crimes without fear of punishment; the list is a long one.

But of all the immorality that was indulged, it was by their sexual behaviour that the churchmen gave the greatest offence. Priests forsook their vows of chastity and celibacy and lived in concubinage, fathering families with secular prodigality, while many monks and nuns turned their monasteries and convents into private brothels.

Though it was principally in the sphere of ethics that the most serious grounds for complaint against the Church lay, there were other important aspects of the Church's rôle which gave grave cause for dissatisfaction, though even here the authority which the Church should have had and could have had was undermined and dissipated by the sexual immorality. How this operated can be seen in the field of doctrine; where the clergy should have been

able to speak without fear of opposition, men were loth to accept the views of those whose sexual behaviour broke every rule of Christian ethics.

From the twelfth century onwards there were extensive, though somewhat disorganized, heretical movements, which rejected one or other of the major doctrinal concepts. For example, round about A.D. 1200, certain Paris teachers adopted the teaching of Averroës, the most outstanding of Arabic philosophers at this time, which denied the personality of God, the Creation and the immortality of the soul.

The Church met all heretical movements with great ferocity. Crusades were organized for their extermination, while the Inquisition dealt out torture and death to individuals with the avowed intention of saving their souls from eternal damnation, while at the same time it confiscated for the Church's use all the possessions of its victims.

In the fourteenth century, doctrinal conflicts sprang up within the Church itself; and from these conflicts came first the removal of the Popes from Rome to Avignon from 1309 to 1378, and second, the Great Schism.

The latter grew out of the former. The Popes had moved to Avignon for political reasons, but when these reasons no longer operated and the Pope of the time, Gregory XI, returned to Rome, upon his death, which followed shortly upon his arrival in Rome, two Popes were elected, one in Rome and the other in Avignon.

For the next thirty-nine years there were two Popes—at times, even three—all claiming to be the true head of the Church. During all this time the Church continued to lose authority. It was certainly the Great Schism which gave force to the heresy of John Wycliffe.

Wycliffe, Master of Balliol College, Oxford, was acknowledged by his contemporaries to be the supreme exponent of philosophical disputation in the University and his lectures were always crowded. It was Wycliffe's view of property which first brought him into conflict with the Church.

He held that since Christ and the Apostles had no property, property is the result of sin. From this he argued that the Church has no concern with temporal matters, and as it is sinful for the clergy to hold property, it is lawful for statesmen who are God's stewards in temporal matters to take away the goods of the clergy.

Since the Church in England—as everywhere else—was among the most extensive owners of property in the country, these views did not appeal to it at all, and Wycliffe was summoned before the

Bishop of London to answer the charge that he was following the heretical error of Marsilius of Padua, who had, a little time before, put forward similar views.

The support of certain powerful secular leaders saved Wycliffe from punishment, but when the Great Schism occurred he turned his hostility towards the Pope. He did not object to there being a human head of the Church so long as this head was a truly righteous man. From this he extended his attacks to the whole organization of the Church and many of its doctrines.

He gathered together a number of preachers and sent them throughout the country to preach his views, and he translated the Bible into English. By these means he removed much of the mystery of religion and made it possible for the simple people to understand the uncomplicated teaching of the Gospel.

At the same time, in learned Latin treatises, Wycliffe attacked the doctrine of Transubstantiation. While he did not, indeed could not, deny the presence of Christ in the Bread and Wine of the Sacrament of Communion, what "he dares not affirm is that the Bread after consecration is essentially, substantially, corporeally and identically the Body of Christ".

This was a major heresy, and even his most ardent lay supporters, when he had been attacking the corruption of the Church, could not support him in this. The Peasants' Revolt of 1381 widened the rift between Wycliffe and his highly placed patrons because the communistic social reformers who played their part in this uprising claimed that their cause was based upon Wycliffe's teaching. In fact, they were merely adapting his teaching for their own ends, and though Wycliffe himself repudiated much of their programme, he and his followers, the Lollards, came to be regarded as political anarchists rather than as reformers of clerical abuses.

Nevertheless when the Archbishop of Canterbury, William Courtenay, resolved to stamp out Wycliffe's heresy and called him before a court of Bishops, his University friends gave him such powerful support that though the court decided against Wycliffe, he was not molested, and in the brief interval until his death—of a stroke in 1384—he continued to inveigh against Church doctrine.

The Wycliffe episode was but one of a number of similar attacks on the Church by men of courage all over Europe—like John Huss in Prague, for example—but the effect they had on the Church's behaviour was negligible. They caused anger and a little confusion for a time, but such was the power of Rome that they were destined to fade out for lack of powerful secular support.

So the situation remained until the beginning of the sixteenth century. Always an inflammatory one, the spark of just the right quality had not yet been struck to touch off the conflagration that could not be put out. But this event was not far off.

On 31 October, 1517, an Augustinian friar from the Black Monastery at Wittenberg, in Germany, pinned to the door of the Castle church in Wittenberg what has since become known as *The 95 Theses Against the Abuse of Indulgences*.

The friar, Martin Luther, had been born to free peasant parents on 10 November, 1483. Later the family moved to Mansfeld, where the father became an iron-ore miner.

Luther later complained of the harshness of his upbringing by his parents, from which it would appear that they were strict disciplinarians. They saw to it that their son was reared in current religious beliefs and popular superstitions.

At the age of seven, Luther was sent to the Latin school in Mansfeld, and proved so apt a pupil that when he was fourteen he was sent to Magdeburg to continue his education. This was followed by entry to the University of Erfurt, where he took his Bachelor of Arts degree in 1502, and at the age of twenty-two, in 1505, his Master's degree.

Having acquired the senior qualification, on his father's insistence he embarked on the study of the law. Two months later, however, he suddenly renounced the world and entered the Augustinian monastery at Erfurt.

At the end of a year's novitiate, Luther took the vows of obedience, poverty and chastity, and at the close of a further year he was ordained into the priesthood. After three years as a lecturer, he was appointed Sub-Prior of the monastery at Wittenberg in 1511. The year before, he had visited Rome on monastery business, and had been painfully impressed by the low moral standards of the Holy City.

He had been Sub-Prior of the Black Monastery at Wittenberg about a year, when, as he was meditating on a passage in St Paul's Epistle to the Romans, there came into his mind the first thoughts which were eventually to lead him to formulate his own version of the doctrine of "justification by faith".

His progress towards the acceptance of this doctrine involved him in a long personal struggle, for despite the most strict observance of the Augustinian Rule, and the most rigorous asceticism, he had failed to find peace of conscience. In his search for a gracious God, it was in his temperament, in the lofty religious and moral standards

he set himself, and in the religious, practical and theological teaching of the medieval Church that the root of his struggle lay.

In his lectures on the Epistle to the Romans, Luther had already shown that given the cause he might turn into a reformer. In this connexion, it must be pointed out that the Germany of his time was thoroughly prepared for a revolt against the Church. There were many flourishing cities, the printing press had been in action for a long time, several vernacular versions of the Bible were in circulation, the Inquisition scarcely operated for various reasons, and the comparative weakness of the central government made it possible for any reformer to be effectively protected by local princes, who might shelter him until his movement had taken a strong root.

The direct action which may be said to have sparked off the Reformation was Luther's act of nailing his *95 Theses Against the Abuse of Indulgences* to the church door.

This act had been motivated by the activities of the scandalous Archbishop Albrecht of Mainz, who was already Bishop of Magdeburg and of Halberstadt when he bribed the Pope to allow him to acquire the Archbishopric. To pay the Pope, Albrecht had borrowed 10,000 ducats (a vast sum) from a banking house, and to pay off this debt the Pope had given him permission to offer Indulgences for sale, on the pretext that the money thus collected was to be devoted to the rebuilding of St Peter's in Rome.

Luther came to hear—as indeed he could not fail to do—of the success of the Archbishop's agents and of the lying prospectus for the Indulgences, and he decided to make these events the opportunity for attacking the abuse of Indulgences in general. His ninety-five reasons for banning the sale of Indulgences included attacks on the whole manner of the Church acquiring wealth.

Besides nailing his Theses to the church door, Luther sent a copy with a strongly worded letter to the Archbishop. Recognizing the threat to his plans, the Archbishop was unwilling to attract attention to it by taking desperate action and Luther was invited to defend his Theses in disputation. This did not take place, but defence and attack upon the Theses were published, with the result that Luther was charged with heresy, and summoned to appear at Rome within sixty days.

The Elector of Saxony now intervened, and for political reasons the Pope consented to refer the case to a legate empowered to receive Luther's submission. The legate insisted on unconditional retraction of his heresy, but Luther refused to retract unless "he were found to be in error by the Scriptures".

A long-drawn-out controversy ensued, until in 1521 the Pope issued a Bull of Excommunication against Luther and called upon the Emperor Charles V to execute it. Again the Elector of Saxony intervened, and Charles summoned Luther to appear for examination before the Diet of Worms, offering him safe conduct and sanctuary while within the city boundaries.

Before the Diet Luther again defended himself stoutly and refused to retract, and in the face of this intransigence Charles ordered him to leave Worms. As he and his companions were travelling through the Thuringian forest Luther was met by a party of the Elector's horsemen who hurried them to the secret safety of Wartburg castle. At the end of ten months, however, opposition from the Elector on political grounds led Luther to leave Wartburg and resume his public activity in Wittenberg.

By this time Luther's courage in resisting all authority spread throughout all Germany and beyond Germany, while the reforms which he was advocating found wide support from the people and many of the princes. (Among those who opposed Luther's teaching was the English King Henry VIII, who published an attack on it for which he received from the Pope the title of Defender of the Faith, which, paradoxically, the sovereigns of Protestant England, from Elizabeth I to Elizabeth II, have continued to hold.)

A Diet summoned at Speyer in 1524 began to lay plans for the setting up of a Church council which would have separated from Rome, and formed a national Church. Any measures it might have taken, however, were disastrously affected by the outbreak of the German Peasants' Revolt in June the same year. The excesses subsequently committed by the peasants shocked Luther, though he had at first sympathized, and he was compelled openly to disown them.

By this time the supporters of Luther had adopted the name of Protestants. The struggle between Protestantism and Catholicism from the final stages of the Peasants' Revolt became subordinated to party politics, but another Diet at Speyer in 1526 procured the decision that "each prince shall act in matters of faith so as to be able to answer for his conduct to God and the Emperor". In June, 1530, at a Diet held at Augsburg, another of the principal reformers, Melancthon, drew up a confession which minimized the differences between the Lutherans and the Catholics.

Since the Empire was at this time being threatened by a Turkish invasion, the Emperor, for the sake of national unity, by the Peace of Nuremberg (1532), guaranteed the Protestants freedom from molestation. This was the beginning of the end of the struggle,

though the Church was to strive to bring the Protestants to heel for another twenty years, until finally the Peace of Augsburg, by which Protestantism was actually legalized, affected half the population of Germany.

In Switzerland and France, in the Netherlands, Denmark and Sweden, Luther's teachings had given rise to Protestant movements whose history followed courses not dissimilar from that which Luther's personal struggle took. Only the English were different.

The quarrel between King and Pope over the King's divorce had already separated the Church in England from the authority of Rome. Having declared himself to be Head of the Church, Henry then decided to put that Church's house in order. He moved without haste, however, but in the reign of his successor, Edward VI, reforms were introduced more rapidly. A return to Catholicism in the reign of Mary was the dying flame of Roman Catholicism here. Elizabeth I recognized that Protestantism had come to stay, and under her reasonably tolerant guidance the Reformation became firmly established until by the end of her reign England had become the leader of Protestant Europe.

The movement which Martin Luther set in motion on that last day of October, 1517, had consequences for the Christian religion as strongly felt four and a half centuries later as they were in its immediate future. Twentieth-century churchmen have now set themselves upon a course designed to heal some of the many breaches which Luther inflicted on the Church's defences. The gaps may be partially filled, but it is doubtful whether there will ever again be one universal Christian Church.



## *The Founding of the East India Company*

### *The Beginning of British Rule in India*

ABOUT THE same time that the English had begun to settle in North America, in the latter half of the sixteenth century, they had also begun to turn their interest to the opposite side of the world. Released by the defeat of the Spanish Armada from the threat to the peace and security of their own islands, and having no strength left, for the moment, to be tempted to seize some of Spain's empire from her, they turned instinctively to trade and adventure, and equally instinctively began to look for both in the east as well as the west.

England's contact with India may be said to have begun when, in 1583, a certain Ralph Fitch, with three companions, set out for the Far East by the overland route. So many years passed without any news of them that they were given up for lost. Then one day in 1591 Ralph Fitch came home again, and the tale he had to tell would not have shamed Scheherazade.

By way of the Euphrates and the Persian Gulf, he had come at last to Goa, where the Portuguese had long ago staked a claim. Arrested as a spy, he had been cast into prison there, and had only been released by the intervention of an English Jesuit resident. He had then visited the court of the Mogul at Agra, and the story he told of the riches of this country caused great excitement in the City of London.

Such great excitement, in fact, that before 1591 passed into 1592, the City merchants had despatched three vessels to do trade with the Far East. Only one survived, and reached Malaya, where it took on a cargo of pepper and spices to a resale value of one million pounds.

On the way home, she was swept by contrary winds across the Atlantic to Hispaniola and Labrador, but in 1593, battered, with half her rigging missing and a mere handful of survivors, who had put off their Captain, James Lancaster, they knew not where, she limped into Plymouth. It was not until the following year that a French vessel put Captain Lancaster ashore at Rye.

Despite the hazards this expedition had encountered, it had nevertheless proved an important point—such voyages to the Far East were feasible. Over the next two years or so, the City merchants laid their plans for establishing Far Eastern trade on a regular basis, and on 31 December, 1600, Elizabeth I granted a charter to "The Company of Merchants of London trading to the East Indies".

First experiences did not hold out the prospect of a long life for the East India Company. With the traditional caution of the City merchants, since the uncertainties of any expedition required to voyage many thousands of miles were so great, the members of the Company wound up their accounts after each voyage and returned all the capital, plus profits, to the investors. This practice led to considerable confusion as soon as permanent agents began to be established in the East, yet it was persisted in until 1657, when the Company raised a permanent capital, and became a joint-stock concern in the modern sense.

The dominant desire of the members of the East India Company was to trade, and though they knew that sometimes, in order to trade successfully, their servants would have to fight, they wanted as little fighting as possible. When applying for their charter, they had told the Lord Treasurer of their resolve "not to employ any gentlemen in any place of charge. We wish to be allowed to sorte our business with men of our own qualitey lest the suspition of the employmt of gentlemen being taken hold of by the generalitie do dryve a great number of the Adventurers to withdraw their contributions."

The founders of the Company, therefore, had no designs on India. They had formed it to trade in spices in the East Indies, the archipelago of islands off the south-east coast of Asia. It was *force majeure* which was to compel them, very reluctantly, to turn their first attentions to the sub-continent.

Six years before the Company had been formed, the Dutch had begun trading with the islands, but their United East India Company was not the private concern that the English company was. It received such heavy official backing that it was virtually a department of State. Already much weaker than their Dutch rivals, the Company's position was weakened further still when, in 1619, James I compelled the Company to accept a treaty with the Dutch whereby the English while having to contribute a third of the cost of the civil and military administrations of the islands, were allowed only one-third of the value of the trading carried on by the Dutch.

A clash of interests such as this was bound to lead to a physical

clash, despite the English Company's pacific intentions. It came to a head in February, 1623, when the Dutch governor at Amboyna in the Moluccas suddenly seized the eighteen English agents resident there, accused them of conspiring to seize the islands and executed ten of them in the presence of the native population.

The massacre of Amboyna went far towards founding the British Empire in India, for it brought to an end English trade with the Spice Islands, since the Company felt itself incapable of defending itself against such perfidy. Within two years, it had abandoned all activity in the farthest East, and was concentrating on India.

In India, the principal rivals—and obstacles—to trade were the Portuguese, who had been firmly established in Goa, and on the Malabar coast, and had been in possession of Ceylon for many years. At this time they were aiming to secure a monopoly of Indian trade with Europe and with the Far East. So here, too, the Company had to be prepared to see its servants fight, for, as much as they disliked it, trade could be had on no other terms.

A dozen years before the abandonment of the Spice Islands' trade, the Company's representatives had already been challenging the Portuguese in India, and had had some success. In 1612, the Mogul governor of Surat, in acknowledgment of the English victory over the Portuguese after a prolonged struggle within his jurisdiction, had granted permission for the setting up of the first English trading-post in the dominions of the Great Mogul. This was the beginning of the collapse of the Portuguese empire.

A year earlier, an equally significant event had also occurred. An English factory had been established at Masulipatam, halfway up the eastern coast, and from Masulipatam, much against the wishes of the Company's directors, Francis Day had acquired for his employers the sovereignty of a strip of land in Madras. Here Day built Fort George, the first fortified factory in India.

Despite these mettlesome activities of its servants and the indisputable fact that India was a rich field to cultivate, the Company was not prepared to take responsibility for developing English influence in India, and for about a quarter of a century it gave almost no effective support to its agents. Underlying this strange state of affairs was really a difference of opinion among the Company's members as to what form the Company should take. The differences might never have been resolved had not Cromwell stepped in and as a result of his inquiries into its affairs decreed that the Company's monopoly should be maintained.

Though historians in the past—and too many still in the present—

have overlooked the fact, the next thirty years, the era of Charles II, was seminal in the history of India. For at the beginning of this period we find the resident in Surat is the local manager of a trading company, while at the end of it he is President of Bombay, head of an executive government, with law courts, a standing army, and a system of taxation.

The first event in this process was a new charter granted in 1661, which added to the old privileges a wider jurisdiction over all Englishmen in the East, and new powers to raise troops and maintain fortifications. The first intention of this charter was to enable the Company to defend itself more effectively against its European rivals. Nevertheless, Charles began to entrust the instruments of government to the merchants.

In 1668 the king handed over to the Company, for a rent of £10 a year, the Crown colony of Bombay, which had come to him as part of the dowry of his Portuguese wife, but which had proved terribly costly to administer. Against all the signs to the contrary, the merchants "believed in" Bombay's future. They fortified it, and in ten years its population rose from ten to sixty thousand.

A change was now beginning to come over the Indian scene. The great Mogul Empire was showing signs of disintegration. Up to now, the English merchants had reckoned on trading within the peace kept by the native rulers and had no thought of administration or government. But the growing ineffectualness of that rule made it necessary for the merchants to protect themselves, and this was the first step towards involvement in empire-building.

The period of this development was one of relentless struggle against seemingly insurmountable odds. Only the strength of Puritan resistance could probably have performed the apparently impossible. Take, for example, the obstinacy of Job Charnock, the Bengal agent.

In his territory the Company needed a port, and Charnock established one at the mouth of the River Ganges. In 1687 he was compelled by the Mogul's soldiers to evacuate it; before the end of the year he was back, only to be forced to leave again the following year. Again he returned, in 1690, and this time was determined to stay for good. And he did. In 1697 Fort William was built there, and from it rose Calcutta, where, for the first time, the Company possessed rights of justice and police over the native population.

But other developments were also taking place in India which were to become part and parcel of a struggle which was to be fought out in Europe and North America a century later.

In the mid-1660s, the French East India Company had entered the field and had leased factories at Pondicherry, south of Madras, and at Chandernagore in Bengal. They were permitted to fortify their factories and to maintain a handful of soldiers for what were practically police purposes.

The leading French figure here was François Dupleix. Realizing to the full the disintegration of the Mogul Empire and the instability of the Mohammedan dynasties, Dupleix conceived the idea of establishing supreme French influence at the courts of the native rulers thus making the French masters of India. Before he could achieve this, however, the British had to be suppressed.

Unfortunately for Dupleix, he lacked the necessary sea-power. A simple duel between the French and the British actually in India might, and probably would, have resulted in a French victory. Sea-power turned the scales completely, because it enabled the British to recover from the effects of defeat while making it impossible for the French to do likewise. Therefore, instead of the French suppressing the British, the British suppressed the French.

The headquarters of the French and British were at Madras and Pondicherry respectively, both situated in the Carnatic; a vast province where the Nawab was a lieutenant of the Nizam of the Deccan. The declaration of war between the French and British in 1744 provided Dupleix with his opportunity. Having previously secured the favour of the Nawab, in 1746 he attacked the British and captured Madras. His progress was temporarily checked in 1748, when the treaty of peace compelled him to restore Madras to the British. But then a new way was opened when the succession both to the Nawab and the Nizam fell into dispute. Dupleix supported two of the claimants; the British the other two.

The French and their candidates seemed on the point of victory when the tables were turned by the brilliant achievements of Robert Clive. Peace in 1754 left the battle drawn, with the French candidate on the Nizam's throne and the British candidate on the Nawab's.

The outbreak of the Seven Years War in 1757 renewed the combat, and this time the British victory was complete. After 1763 the Nawab of the Carnatic was their puppet, and South India was divided between four powers—the British, the Nizam, the military state of Mysore just founded by the Mohammedan adventurer Haidar, and the Mahrattas. The rapidly expanding power of the last was utterly crushed at the third battle of Panipat by the Afghan ruler, Ahmed Shah.

In the meanwhile the British had in effect acquired a new

dominion in Bengal as well as in the south. In Calcutta the local native potentate, Suraj-ud-Dowlah, shut up one hundred and twenty British residents in a small room in such conditions that all died. As a result of this outrage, known to history as the Black Hole of Calcutta, Clive was sent to Bengal with a punitive expedition. His sensational victory at Plassey on 23 June, 1757, made him the responsible master of Bengal, with complete control over the new ruler who was set up in the place of Suraj-ud-Dowlah. The position was regularized in 1765 when the Mogul, still the nominal sovereign of India, recognized the British as administrators of the province, while the Nawab of the neighbouring province of Oudh became their protégé and dependant.

British ascendancy dates from Plassey, but the whole area under definite British control down to 1790 comprised only one-eighth of India. The authority of the British was vested in the East India Company, a trading concern without experience in political administration.

The home government awoke to some sense of its responsibilities and Lord North's Regulating Act of 1773 devised an experimental system, under which it became the task of the Governor-General, Warren Hastings, not to extend the dominion, but to maintain the existing position. In the face of enormous difficulties, Hastings succeeded in this tremendous task and left India in 1785, having laid the foundations of the administrative system in Bengal upon which the structure of the British government in India was afterwards built up. But his rule had shown the necessity, first, for greatly increasing the freedom of action of the Governor-General, and, secondly, for the assumption of ultimate responsibility by the imperial government at home.

The result was characteristically British—a compromise, which though logically indefensible, was practically successful. Pitt's India Act of 1784 appointed the Governor-General as the choice of the home government, and gave him general instructions, but at the same time authority to act on his own judgment.

By this time there were two aggressive native powers. Tippoo, the Sultan of Mysore in the south, and the Mahrattas in central India. And behind them loomed the fear of the recrudescence of the power of France in alliance with the enemies of the British. Tippoo forced war on Lord Cornwallis, and had part of his territories annexed as a result in 1792. But this did not deter Tippoo, who was finally quelled by Wellesley in 1799, when more territory was annexed, and Mysore was taken under British protection.

Wellesley developed the system of subsidiary alliances. He saw the necessity, if India were to survive, for a paramount power able to prevent aggression and enforce order. That power must naturally be British. He therefore pressed upon the native rulers the substitution of a protecting force under British control for huge native levies. At the same time, the Mogul, the supreme native ruler, was taken under British protection, and the British Government assumed his sovereign authority.

The decisive struggle with the Mahrattas came under the rule of Lord Moira (1813-1822), and the outcome was the transference of the Peshwa's dominions to direct British control. The north-west still remained untouched, but there was a short and sharp conflict with the Gurkhas of Nepal, which resulted in a large cession of territory and the permanent establishment of friendly relations with the Gurkha kingdom. A deliberate challenge from Burma in 1823 led to the first annexations of territory in what was called Farther India in 1826.

The next twenty years, following upon Moira's rule, saw no further expansion. Fear of French aggression was replaced by fear of a Russian advance through central Asia, and suspicion that the Amir of Afghanistan was intriguing with the Russians led Lord Auckland's government to depose him in 1839 and to restore the ruler he had ejected. The reinstated Amir was supported by a British force at Kabul, until in 1843 the Afghans rose, cut up the British who were retreating under an ignominious capitulation, and forced them into a campaign which ended, admittedly, in the defeat of the Afghans, but also showed that the British had made an error of judgment in reinstating their supposed protégé. So they deposed him, and put back on the throne the man whom they had deprived of it. Dost Mohammed now proved himself a loyal ally.

In 1839, the great Sikh Maharajah, Ranjit Singh, who had built up the powerful Punjab state, died, leaving an army full of confidence but with no controlling head. In 1845 it crossed the Sutlej and invaded British territory. A bloody campaign ended in the defeat of the Sikhs, but in 1848 a second war broke out, and after further fierce battles the Punjab was annexed in 1849.

Lord Dalhousie, the current Governor-General, having annexed Lower Burma, as the result of a second challenge from that quarter in 1852, then hit upon a means of extending British rule. Convinced that every expansion was for India's good, he introduced the legal doctrine that when a territory was left without a legitimate heir, the territory lapsed to the paramount power. By these means, when

Dalhousie retired in 1856 British rule had been extended to something like two-thirds of all Indian territory. The conquest had been achieved by troops which were for the greater part non-European. In the army of the East India Company, theoretically the Lord paramount of India, the Queen's regiments and the Company's own regiments were in 1856 outnumbered five to one by native regiments, though European officers commanded the latter.

Wherever British administration was established, order followed and general benefits accrued. But often a lack of sympathetic intelligence caused British methods to run violently counter to Hindu sentiments of immemorial sacredness, while the Mohammedans, dominant before the British ascendancy, resented their changed status, and the Mahrattas, too, were equally resentful.

Though on the surface all was well, under it doubts and questionings, hopes and fears were seething. In particular a fanatical group of Mohammedans were dreaming of a Mogul restoration, while Nana Sahib, the Mahratta Peshwa, nursed a bitter grudge against the British Government.

This state of affairs culminated in the Indian Mutiny, a stupendous event which brought home to the British people the anomalous character of their rule in India and the necessity of assuming national responsibility for her welfare. The East India Company was therefore wound up and the control of India formally transferred to the British Crown.

A period of active development now began. In 1860 the penal code originally drawn up by Lord Macaulay in 1837 was adopted, and in 1861 the Indian Councils Act, giving seats to Indians on the Governor-General's Executive Council, marked the first step in the closer association of Indians with the machinery of government. The opening up of the resources of the country was fostered by the extension of the railways and roads, and by further irrigation works.

The visit of the Prince of Wales, later King Edward VII, in 1875 was the occasion of remarkable demonstrations of loyalty to the Crown, and in the following year the Queen's favourite minister, Benjamin Disraeli, devised a title for his beloved sovereign, and she became Empress of India, a title which was retained by her successors until it was surrendered in 1947, with the end of British rule.

Between 1876 and the latter date, the Indian Government filled the rôle of a benevolent despot. It was highly efficient and under it India achieved a greater degree of well-being and rate of progress than would have been the case had the British—or any other



European power—not welded the many governments under one central authority.

Clearly, however, a civilization as old as India, whose people had once been powerful, and, after their fashion, independent, would not for ever be content to remain under foreign tutelage. The first signs of nationalism made their appearance under the great Viceroyalty of Lord Curzon between 1899 and 1905, and over the next half-century they increased, until it was evident, when the Second World War ended, that British rule in India must soon end, too. In 1947, C. R. Attlee, the British Prime Minister, appointed Lord Mountbatten to be Viceroy with the express purpose of bringing British rule to a close as quickly as possible. This was actually accomplished within seven months.

By 15 August, 1947, the British had completed their withdrawal and on the same day, amid celebrations in India and London, two new dominions, of India and Pakistan, were proclaimed. British rule in India had ended.

A progression over three and a half centuries had culminated in that very rare event in international affairs—an occupying power voluntarily relinquishing its suzerainty over another country. Though the association of Britain with India had been marked, at any rate up to the middle of the nineteenth century, by a full share of strife, nevertheless unlike many occupying powers she brought to the sub-continent a standard of impartial justice and a tradition of incorruptibility in civil administration unmatched anywhere else in the world.

The fact that India and Pakistan elected to remain within the Commonwealth after independence, and that their civil services and judicial systems remained modelled on the British pattern, is a tribute to the enlightenment of British policy.

# *The Voyage of the Pilgrim Fathers*

## *The Founding of the Modern American Nation*

THE WILLINGNESS of men to accept suffering in every degree and even the pain of death to establish their right to worship as they please, has been a phenomenon at all periods in history wherever a monotheistic religion has been adopted as a national religion. The religions which were based on the recognition of many gods were always much more tolerant of anyone who found himself out of step with their teachings and observances, and only when such heretics threatened to endanger the State—as in the case of the Roman persecution of the early Christians—did the State take much interest in them.

Of all the monotheistic religions, the one basing its teaching on the love and understanding of the Deity has been the most zealous in bringing its benefits to men and so eager and insistent upon forcing the soul's salvation upon reluctant or dissenting adherents that it has the highest record for intolerance of all the religions. This intolerance has, at various times since the death of Christ, the founder of the religion, produced some of the most iniquitous crimes against man.

It represents probably the greatest paradox that history can provide, for based on the love of God for mankind and teaching the essential necessity for man to love his fellow-men, even his enemies, imprisonment, tortures and death have been inflicted not only on those who refused to accept it, but especially on those who having accepted it in principle have yet been unable to accept in some cases the dogmas, in others, mere forms of worship. That is to say, it has proved most harsh to those within its fold rather than to those who have, in its view, foolishly rejected it altogether.

This, of course, has not been the fault of the religion, but the fault of organizations devised by men to make its teachings available. A religion which can be so wide in the application of its principles as to support various forms of teaching and worship within one branch of it—for example, English Protestantism as represented by the Church of England shelters Low Churchmen and Anglo-

Catholics, Evangelicals and Modernists—by the extraneous power which its presentation and administration bestowed on the teachers and administrators found that this power became more important than the salvation of men through belief in a basic faith, though it was in the name of saving souls that it sought to maintain its power.

Neither of the two main branches of Christianity—Roman Catholicism and Protestantism—at all events in Europe, can claim immunity from the charge of having committed crimes against humanity in the name of the Deity; neither can claim with justification that it was man's eternal salvation alone which motivated them; both must admit that their main concern was the acquisition and retention of temporal power. It was the pursuit of this power that began it all.

For the first fifteen hundred years after the death of Christ there was in Europe only one Christian Church, teaching only one version of the Christian religion. Its headquarters were in Rome, and its head was called the Pope.

The early Roman Church had carried out the injunction of the founder of its religion, "Go ye out into all the world and preach my Gospel," and by a series of missionary enterprises had brought Christianity to the peoples of western Europe, among whom it had set up branches of its own organization. These branches were limbs of the main body of the Church in Rome. Its local governors, the archbishops and bishops, its abbots and its priors, were chosen and appointed by the Pope, and they were under obligation to him to see that every decree that issued from him was faithfully carried out.

Over the centuries, the temporal rulers, both emperors and kings, princes and dukes, in order to secure the paramount benefit which the Christian religion had to offer—a blissful existence in an eternal hereafter—had been prepared in all matters pertaining to religion within their realms to submit to the Pope's authority, and from quite early on they had treated the leaders of the Church on the same level as their own great temporal lieutenants, and had made them grants of land and permitted them to raise revenues for the financing of their work.

So wealthy did the Church become that very soon its influence was extended to the temporal sphere, and though by the end of the first millennium a number of the temporal rulers were beginning to resent this influence to the point of resistance, the Pope and his great lieutenants were able to subdue all opposition.

It has long since become a cliché that power corrupts, but it was

certainly true of the Roman Catholic Church. By the Middle Ages greed for power and wealth and the satisfaction of this greed had led to a degeneration in the general moral behaviour of the officials of the Church, and rapidly became so embracing that among people who were naturally profligate, the sexual morality of Pope and cardinals, archbishops and bishops, abbots and priests, monks and nuns set them apart as profligates without equal.

From time to time the rumblings of a shocked and disillusioned laity protesting against the general laxness of the Church, from Rome to the Orkneys, was heard; but the power wielded by the Church was such and the inherent simplicity of even the most highly educated laymen such that no protest was ever pushed to effective action.

At the beginning of the sixteenth century, however, a new protest began to be heard. It emanated from a simple German monk who, greatly daring, criticized the Pope himself and all the Pope's great lieutenants, and with such effect that his protests could not be ignored. Once papal notice had been taken of him, nothing could be done but to refute his accusations successfully and immunize the Church from the danger he represented either by putting him away where he could be cut off from contact with the world, or even by death as a heretic.

To its surprise and consternation, however, the Church found that Friar Martin Luther had, in his protests, put into words for the first time in a form which many could understand the thoughts and feelings of a vast number of men, among whom were powerful temporal rulers. To the Church's even greater consternation it found that these temporal rulers, sure of the support of their subjects, were prepared to give their powerful protection to Luther. Nevertheless, Pope and the Holy Synod could not afford to retract, and though Luther could not be removed from the scene, every attempt had to be made to prove his accusations unfounded and to convince the people by argument of the Church's rightness in all matters.

The struggle between Luther and his supporters and the Pope and his lieutenants went on for many years, and just as it was beginning to come to one of its several climaxes in 1525 something happened absolutely unconnected with the protest of the German monk, but which, nevertheless, produced the first fracture in the universal authority of the Roman Church.

Henry VIII of England had been married to his wife Catherine for twenty years and she had produced him no heir. Concerned—by the need to establish a strong succession, he contended, though in

fact he had fallen in love with a voluptuous gentlewoman to the point of obsession—Henry decided that he must divorce his wife in order to marry Anne Boleyn.

The only person who could make that possible was the Pope, who alone had authority to annul marriages. But now the temporal power which the papacy wielded was to prove, by involving the Pope in temporal politics, an instrument in its own undoing.

A nephew of Queen Catherine was Charles, who besides being hereditary king of Spain had also been elected Holy Roman Emperor. At the beginning of his reign as Emperor he had fallen into a dispute with France over the possession of territories in Italy, had declared war on Francis I of France and had defeated him.

The power that Charles now exercised over large parts of Italy threatened the temporal power of the Pope, and a quarrel had broken out between the two men, with the result that Charles had attacked and sacked Rome and made the Pope his prisoner.

And Clement VII was still his prisoner when Henry VIII asked the Pope to annul his marriage with his captor's aunt. The Pope was therefore in no position to grant Henry's request.

But Henry was also a powerful monarch, and not wishing to alienate him by an outright refusal, the Pope stalled. For several years argument and counter-arguments passed between London and Rome, until at last, Henry, unable to accept any further delay with patience, declared that the Pope no longer had any authority over the Church in England, appointed himself the Head of that Church and directed the compliant Archbishop of Canterbury to grant him the divorce the Pope had refused.

Happily, Henry was a very different character from that other English king who had once been excommunicated by the Pope. By this time the great barons of England had ceased to be so warlike as John's great barons had been, the powers of the Crown, with the passage of years, had become more subject to the authority of Parliament and Henry had neither the rapacity of John nor his need for money. Besides, the educated classes of England were now more sophisticated than the gentry of thirteenth-century England had been.

Not only that, the reputation of the Church in England was as bad as that anywhere; there had already been several attempts to protest; and the reluctance of the people to pay Peter's Pence, a tax imposed by Rome and paid to Rome, was bound to make any slackening of the Pope's influence popular.

When Henry cut the Church in England off from Rome, almost

immediately he set about purging it of its worst features, by subjecting the hierarchy to his own discipline and closing down the hotbeds of vice which the monasteries had become. Nevertheless, it was not his intention to interfere with the religious rituals nor with the dogmas which the Roman Church had developed.

It was only towards the end of his reign, when the Reformation had become established on the Continent and he was being regarded as one of the great Protestant leaders, that he began to plan reforms in ritual and religious teaching. But it was not until the reign of his successor, Edward VI, that these reforms began to be really effective, when the English translation of the Bible was ordered to be kept in the churches and the first Prayer Book in English by law made the only form of worship in the English churches a ritual shorn of all its popish character.

But once a physical break with Rome was made in this way, there came into existence a desire on the part of some for absolute free expression in matters of religion. It was not enough for them that the hated shackles of Rome had been cast off, nor that the former ties with the Roman teachings and Roman ritualistic practices had been abandoned; they began to conceive their own ideas of God and religion and to demand the right to translate those ideas into a form of worship which was not prescribed for them by the State.

On the other hand, there were those who regretted the break with Rome, and wished to continue at least to worship in the old Roman forms.

Against both, the Protestants and the old Catholics, the State reacted firmly. The Forms as laid down in the English Prayer Book were to be the only permissible forms of worship; and the new dogmas as expounded by the English ecclesiastical authorities were to be the only beliefs acceptable. In effect, the people of England found that they had exchanged one religious tyranny for another, for laws were introduced making any deviation a punishable offence.

The return to Catholicism in Mary's reign increased the revulsion to Rome, and Elizabeth I with popular approval extended her father's and her brother's reforms. In the matter of enforcement she found that she had to go further than her predecessors, and require her subjects to worship by law. An Act of Parliament was introduced making attendance at church at least once on a Sunday obligatory under pain of a fine of one shilling, equivalent in our day to fifty shillings.

The ecclesiastical authorities had not learned the lessons of the

Christian martyrs. They did not seem to appreciate that nothing so stimulates revolts of conscience in religious matters as persecution. The fact that they were to be dragooned into conformity in religion strengthened the resolve of the more extreme Protestants to kick against the pricks of the established Church.

Deriving its spiritual principles from the Reformation, a separatist movement sprang up in protest against the Elizabethan church settlement and the royal supremacy in church affairs. The leader of these early Independents, as they called themselves, was one Robert Browne. He declared the principle of the lordship of Christ over His Church as against the royal supremacy, and the principle that the Church consisted only of Christian believers and that such believers, gathered together into local churches, had the direct responsibility under the guidance of Christ for the government of the churches. The Independents—later to be called the Congregationalists—therefore stood for the voluntary principle as against every form of absolutism.

This was more than Elizabeth could support, and the Independents came under the most rigorous persecution, and some of their leaders, notably Barrow, Greenwood and Penry, were put to death. The persecution continued under the Stuarts, and in 1608 the then leader, John Robinson, to escape further persecution, crossed with some of his followers to Amsterdam.

The Low Countries, which had suffered much from the Catholics during the invasion of their country by Philip of Spain, had embraced the Reformation more ardently and totally than any other European country, and was looked upon as a refuge of all persecuted Protestants. In 1609, Robinson was appointed pastor of a church in Leyden and there he conceived the idea of a Puritan colony in America.

A century had elapsed between the discovery of the New World by Columbus and the beginning of any systematic colonization. It is true that the Spaniards had started a settlement in Florida in 1565, but it was not until 1606 that the English began to consider that it might have possibilities of a commercial kind. In the following year, James I granted a charter for the planting of colonies in Virginia, so named after his illustrious predecessor, the Virgin Queen.

Though Robinson and the Independents were well treated in the Low Countries, they wished to retain their native language and customs, and this was very difficult to do, living as they did surrounded by a people speaking a foreign tongue and used to doing

things differently. It took Robinson some years to formulate his scheme so that it could become a practical undertaking.

However, he received the sympathetic support of the Virginia Company, who made him and his followers a grant of land. Other powerful supporters of the Puritan party also obtained for the would-be colonists a promise from James that in their new home they should be free to worship as they pleased and would not be interfered with.

By 1620 all preparations for the venture were complete. Those from Robinson's congregation who had elected to go—Robinson was to have followed later, but was prevented by his work from doing so, and he died in Leyden in 1625—crossed to England, and there joined with others from the Independents who had remained in England.

On 6 September, 1620, a party of seventy-eight men and twenty-four women set sail from Plymouth, in Devon, in a square-rigged brigantine, double-decked, broad in the beam, with upper works rising high in the stern, called the *Mayflower*, commanded by her part-owner, Captain Christopher Jones.

The *Mayflower* ran into bad weather on the crossing, and on 21 December the party were forced to land on the coast of Massachusetts, far south of the territory granted to them. Here they founded Plymouth Colony.

The colony prospered, and though the hardships experienced were tremendous, the freedom in religion more than compensated for them, and the example of the Pilgrim Fathers, as these first colonists were called, was followed by others as the religious troubles at home increased under the intolerance of the Stuarts.

In 1629, other Puritans crossed the Atlantic and established a colony in Massachusetts Bay. They were followed at frequent intervals by others, who founded colonies in Connecticut, Rhode Island, New Hampshire, Vermont and Maine. In 1664, under external pressures, these colonies united in a confederacy called the United Colonies of New England. These with the later-founded colonies of Pennsylvania, North and South Carolina and Georgia rebelled against the Westminster Government in 1776 and declared their independence, and the United States of America came into being.

No other great nation in the history of the world has had its foundations laid in this way. Probably no other event in history shows so clearly the relation of cause and effect.



## *Discovery of the Blood's Circulation*

### *William Harvey Lays the Basis of Modern Medicine*

BLOOD, SAID the Greek physician Galen in the second century A.D., is manufactured in the liver from the food we eat, and is of two quite different and separate kinds. The two kinds are sucked up from the liver to the heart and sent out to the limbs and organs of the body from the heart's two sides: the bright red blood through the arteries, far beneath the skin, and the other, darker variety through the veins which lie nearer the surface. The two varieties provide different elements for the nourishment of limbs and organs, and both pass through the lungs on their way, being cooled in the process. Hot blood, straight from the liver, is too fiery, must first be cooled by the air we breathe. Much illness is caused by this blood being insufficiently cooled, and in cases of this sort the only treatment is to drain a little off with leeches, or by actually opening a vein and letting the fiery fluid run away.

The blood when it reaches the limbs and organs of the body is used up entirely, and a new supply must constantly be produced in the liver from the food eaten.

This theory, incorrect—and verifiably so—in almost every detail, was subscribed to by the medical profession for fourteen hundred years. It remained for William Harvey, with his essay printed in 1628 under the imposing Latin title *Exercitatio Anatomica de Motu Cordis et Sanguinis*, to prove otherwise. His discovery, that the blood does not merely travel centrifugally to the extremities, get used up and disappear, but circulates continuously through heart, lungs, arteries and veins—an utterly novel, startling idea—is the basis of modern physiology, modern medicine. With its publication, medicine leapt from the ancient world to the modern, skipping a millennium and a half in the time it took to read the words, if a physician could read them calmly enough, in the seventeenth century, to get to the end: "What is now to be said on the quantity and source of the blood is so novel and unheard of that I tremble lest I have mankind at large for my opponents. So much doth want and custom become a second nature . . ."

Harvey, after years of study in Padua, the anatomical workshop, men said, of the world, had estimated the quantity of blood sent out by the heart in each one of its pulses. He had been studying hearts of animals, birds, reptiles and men, noting their four chambers, measuring their dimensions, and he estimated that the amount of blood pumped by that organ was, in the case of an adult man, two fluid ounces with each beat. On average the human heart beat seventy-two times a minute—a fact with which even Galen would not have quarrelled. At that rate, a quantity of  $72 \times 60 \times 2$ , or 8,640 ounces of blood, would be pumped out by it, in the course of every hour. This, Harvey saw, was three times the weight of the adult body. If all this vast quantity of blood were dissipated, as Galen had stated, if it had to be replaced by food, a man would be eating three times his own weight in every hour of the twenty-four.

This was obviously nonsense; and so it was, in Harvey's mind, a logical step to a theory in which blood circulated from the heart to the extremities *and back again*, before being re-used. The construction of the organ, with its four little chambers, two on each side of a central wall, and its valves which now, to Harvey's eye, showed the direction in which the blood must flow, made his theory not only tenable but irrefutable. He went on, by a simple class-room experiment, to show that there were valves not only in the heart but in the veins. They were valves which allowed the blood to flow *away* from the extremities, *toward* the heart, and only in that direction, so that Galen's theory of blood travelling outwards in the veins was doubly shattered.

Harvey's experiment was to tie a bandage very tightly round the arm, midway between elbow and armpit, and twist the bandage with a small stick (a "tourniquet") so that all flow of blood stopped. After two minutes the hand became blue and cold. Now if he released his bandage by a turn on the stick, leaving only a "medium tightness", the hand would become engorged with blood and start to swell, at the same time displaying the valves in its surface veins as hard knots. Harvey's explanation was: "The tight bandage not only obstructs the veins, but the arteries; whereby it comes to pass that the blood neither comes nor goes to the members. The medium bandage again obstructs the veins, while the arteries, lying deeper, being firmer in their coats and forcibly injected by the heart, are not obstructed but continue conveying blood to the limb. Wherefore follows the unusual fullness of the veins and the necessary inference that the blood flows incessantly outwards from the heart by the arteries, and ceaselessly returns to it by the veins. . . ."

(For any reader who cares to try Harvey's experiment, it is worth noting that both "tight" and "medium" bandages on a limb are dangerous if kept on for more than a few minutes.)

Another experiment was to grasp a staff tightly, so that the veins in the forearm were displayed. Then, by pressing a finger-tip on them at various points, it was possible, observing closely, to see which way the blood flowed. There was no question about it: blood in the veins flowed to the heart, never away from it.

The circulation of the blood had been discovered, proved. From the left side of the heart, the lower of the two chambers on that side, or "left ventricle", the blood was pumped out through the arteries to every part of the body. Then, through some "leakage" which Harvey failed to understand and at which he wisely made no effort to guess, it found its way into the veins and returned, this time to the right side of the heart, its upper chamber or "right auricle". From here it passed through a one-way valve to the lower chamber on that side, the "right ventricle", and was pumped out again, to the lungs, returning from them to the left side of the heart, an upper chamber or "left auricle". A descent through the one-way valve on that side to "left ventricle", and it set off again, through the arteries, to each part of the body.

So much could be proved and Harvey was content to leave it at that. In one way, this was a measure of his greatness. He had made a discovery which could be proved, and by several different observations. He was satisfied; he would not try to extrapolate a complete physiology of circulation and respiration, because he had no means of proving it. That could wait. Others had been eager to manufacture nonsensical and involved theories from a few shreds of misinterpreted evidence, and the medical profession, which was then (and still, some say, remains) a religion, like English Law, unquestioned, unquestionable, sacrosanct, were anxious to go on believing them. One can only conjecture how history might be rewritten if the rulers, tyrants, statesmen and scientists who died as a result of "blood-letting" and other treatments, based on a misunderstanding of the function of the blood, had lived.

Harvey's "wicked and heretical" theory was gradually accepted, simply because it was impossible to refute. His successors were able to establish, with microscopes that Harvey did not possess, that the arterial blood crossed to the veins at the end of its outward journey, through tiny, hair-fine pipes or "capillaries" (from the Latin word for "hair") just under the skin. At this point it did its "work", returning through the veins to be pumped to the lungs, where it

underwent a chemical change, releasing the carbon-dioxide which it had brought back from the extremities, a waste-product of its work, and replacing it with oxygen.

All arteries, then, carry blood away from the heart and all—with the exception of one—carry bright red, oxygenated blood. All veins carry blood back to the heart and all—with the exception of one—carry dull red blood, full of carbon-dioxide, on its way to the lungs. The two exceptions are the pulmonary artery, which carries “used” blood from heart to lungs, and the pulmonary vein which brings oxygenated blood back from lungs to heart.

William Harvey was the man who made of “anatomy” a new science of the living, moving body, the science of physiology. For generations men had been content to deal with matters of quality, of “humours” and vital forces in the body, a “spiritus” which was somehow injected into the blood by the brain, and so forth. No one had ever used a yardstick, a scale, a unit of measurement; but Harvey, watching the exposed, beating heart of an animal, watching the organ draw itself together, contract into a small hard ball, push blood into the aorta, was the first man to ask, “how much?” “how often?” “which way?” and “where?”; to treat the body as a machine, find out what made it work. The consequences of his discovery were immense, the most important step that had ever been taken in medicine: one which has probably only been approached in magnitude by the twentieth-century discovery of antibiotics.

William Harvey was born, on 1 April, 1578, in Folkestone. His father was a well-to-do merchant and was able to send the boy to Kings School, Canterbury, and to Cambridge University. As soon as he had taken his B.A. degree he travelled to Padua, which was felt, in the seventeenth century, to be the finest medical school in the world, particularly for anatomical studies. Here he studied for several years under the great anatomist Fabricius, becoming a Doctor of Medicine in 1602, when he was twenty-four.

He returned to England, obsessed by what he had learnt, and although he was appointed physician at St Bartholomew's Hospital in 1609, although he had plenty of patients and much to do, he remained principally concerned with anatomical problems. Unlike the doctors of the sixteenth century, who had been delighted by the beautiful proportions, the harmony, of the human body, Harvey was concerned with its movement—the only attribute, he pointed out, which made it different from a marble statue. And the two movements which were ceaseless from birth to death, the pulse and breathing, these were what Harvey was most interested in.

## DISCOVERY OF THE BLOOD'S CIRCULATION

But his practice was growing, his professional reputation, despite this private obsession, was increasing with each month, and he had the greatest difficulty finding time for research. In 1616, after he had been appointed professor at the College of Physicians in London, he gave his first lecture, and from the manuscript notes that survive we can see that he had solved, in his own mind, the problem of the circulation of the blood. How his audience reacted we do not know, but Harvey knew enough of his colleagues in the medical profession to realize that they would be not only sceptical but outraged, even abusive, unless he made his theory fool-proof—physician proof. He went on with his experiments, dissecting men, animals, birds, snakes—anything—and measuring what he found.

Two years after this lecture he was appointed Physician-in-Ordinary to King James I and when that monarch died he went on to serve Charles I in the same capacity. Still he checked, double-checked, his theory, expanding it slowly and carefully, only as far as his observations justified.

It was not until he had been in royal service for ten years that, as we have seen, he published his famous monograph in 1628. Immediately there was a storm of anger. What right had this "heretic", this "devil", to toss aside the teachings of a thousand years? There were angry meetings of medical men, demonstrations in the street. To the general public he became a "crackbrain".

The Civil War added to Harvey's problems. He had little interest in politics, but he was the king's physician and as such he was present at the Battle of Edgehill, where his task was to take care of the young Prince of Wales and even younger Duke of York. While he was away his house was ransacked and many of his papers stolen or destroyed. History relates that he brought his young charges to a quiet hedgerow and had begun to read to them when a cannonball landed a few yards off. The king's physician and the king's two sons were then seen tearing across the field in search of shelter. Fortunately for history and mankind, they found it, and Harvey was allowed to go on for another decade working on embryology—the origin of human beings, their development in the maternal womb—a study to which he contributed greatly, but which is outside the scope of this article.

When the king moved his court to Oxford, Harvey was delighted; he was able to continue his studies there. He was received with civility at first, then warmth, as his theory became gradually accepted, and at last he was made Warden of Merton College. He retired into private life in 1646, "much troubled with gout".

#### DISCOVERY OF THE BLOOD'S CIRCULATION

During the eleven years of life that remained, his theory became accepted all over the world. In 1654 the College of Physicians wanted to confer upon him the highest possible honour, that of President, but Harvey declined, saying he was too old. He returned the compliment by erecting a new building for the college and equipping it with a library and a museum. He died, on 3 June, 1657, a widower and childless, bequeathing his estate at Burwash in Kent to the College of Physicians, and with it a fund for an annual lecture. The Harvey Oration is still given, each year.

## The Science of Newton

### *The Calculus, the Theory of Gravitation, and the Spectrum of Light*

AN APPLE fell: he watched, decided that the earth had pulled it. Hence the force of gravity.

Were this story the truth, the whole truth, no one would have heard of Isaac Newton. Countless thinkers had watched apples drop, many had concluded there was some force inside the earth which made them fall. None had ever considered, as Newton did, that even the moon might fall to the earth, that it was only prevented from doing so by the centrifugal force of its movement round the earth. Nor was anyone likely, as Newton did, to calculate the magnitude of this force, then deduce the inverse square law of gravitation from it.

He was one of the greatest all-rounders the world has ever seen. His contributions in pure mathematics, theoretical physics, experimental physics, had never, until the time of Einstein, been surpassed. Einstein surpassed him in theoretical physics, Gauss equalled him in pure mathematics, Rutherford, perhaps, in experimental physics. No one has equalled him in mastery of all three together. For sheer intellect, Archimedes may have come near him—but the achievements of the two are impossible to compare. In Greek times, science was far from the stage where it could present the exciting problems it did to Newton.

He devoted most of his intellectual energy, which was enormous, to history, theology, chemistry, alchemy and politics. He gave up science at the age of fifty-four, though at the age of eighty he was still able to discuss improvements to his famous *Principia* and *Opticks* with his young disciples. He had made his three greatest discoveries, the Calculus, the Theory of Gravitation, the Spectrum of Light, by the time he was twenty-four.

Newton the man has been completely overshadowed by Newton the thinker, and though we are more concerned here with what he did than what he was, it is worth while having a look at the man himself. He was obsessed with the desire to be considered a

gentleman. He had inherited land with a rent of only £30 a year, but it carried with it the legal rights and duties of "Lord of the Manor". These he exercised throughout his life with the most painstaking attention to detail, even solving small problems of tenancy when he was in the middle of writing the *Principia*.

He went to endless trouble to prove (to his own satisfaction, if not to others') that he was a relation of Sir John Newton, Bart.; having satisfied himself on this point he troubled Sir John for years with chatty, cousinly, letters.

He left academic life without a qualm and became Warden of the Mint because it provided a good social position and a good income. And yet he might have had the social position and the income if he had agreed to become either Master of Trinity College or Provost of King's. He refused to become either, as that would mean taking holy orders, and he had religious doubts—even though the Archbishop of Canterbury, Dr Tenison, was prepared to ignore these, raise him to holy orders immediately and give him any preferment in the Church he required.

But it was long before he left Cambridge for the Mint that he composed his *Principia*, believed to be the most concentrated intellectual effort made by man. For two of his academic years—1665–1667—the university was closed because of the plague, and he returned to the house of his birth at Woolthorpe in Lincolnshire. Here, living with his mother in quiet, country surroundings, he found himself in a perfect situation for thought. As a hobby, he worked out, for the first time in history, the area subtended by a hyperbola, with the help of his newly invented Calculus, and for fun he carried the answer to fifty-two places of decimals. He was fascinated by optics; he ground lenses with great dexterity, and from them he fashioned telescopes. He found that the images in his telescopes were blurred, had coloured edges, and when he began to investigate this he made the enormously important discovery that white light is in fact a mixture of rays of all colours, a "spectrum".

He considered this and decided—not entirely correctly—that the ordinary sort of "refracting" telescope in which light passes from the object viewed, whether it be the moon or a distant star, through a series of lenses to the eyes, could never be made satisfactory, because each colour in the spectrum was bent, or refracted, a little more or a little less than all the other colours, so that they could never be perfectly focused together. He decided to devote some of his energies to a "reflecting" telescope, in which light is reflected



from a large concave mirror via a small flat one into the eye, never passing through glass. (It has since been shown that lenses can be made of a combination of different glasses which will reduce this "chromatic aberration" almost to zero.) Newton's reflecting telescope is the ancestor of the giant 200-inch one at Mount Palomar.

Throughout the time he was rejecting the refracting telescope, making a reflecting one, his mind was engaged in mathematics. He was fascinated by the theory of Copernicus who had proved that the earth went round the sun and not vice versa, and now Newton went on to speculate as to why earth and planets moved at all.

It was at this point, in the garden at Woolsthorpe, that the apple fell.

He returned to Cambridge when the plague had subsided and in that year, 1667, he was elected a Fellow of Trinity College. He had developed his Theory of Gravitation at Woolsthorpe but now, characteristically, he refused to write it down. He accepted a professorship, which was a help to him as it carried a salary of £100 a year with the obligation only to give twenty-four lectures. He had framed his Laws of Motion, the first of which stated that a body at rest will continue at rest unless a force acts on it, and a body moving steadily in a straight line will continue to do so unless a force acts on it. This was in direct opposition to established thought on the subject—why, *anyone* could see that a ball rolling along the ground stopped ultimately of its own accord. Newton proved mathematically that this stopping was due to friction. As for a ball thrown in the air, that was affected not only by the friction of the air, but by the earth's gravity.

His second Law of Motion states that force is measured by rate of change of motion, the simplest case being that of gravity, in which the force and therefore the rate of change of velocity are fixed. This he showed to be 32.2 feet per second, in every second. In other words, a falling object is travelling at 32.2 feet per second at the end of the first second, 64.4 feet per second at the end of the second second, 96.6 feet per second at the end of the third, and so on.

The third Law of Motion is that action and reaction are equal and opposite. For example, the moon pulls the earth with the same force with which the sun pulls the moon—and this can be shown by studying the tides. These laws of motion, and far more besides, were embodied in the book he was eventually persuaded to write, *The Mathematical Principles of Natural Philosophy*, known—because it was written in Latin, the language of educated men all over Europe—as the *Principia*. The work, held by many as the greatest

scientific book ever written, is in three "books", and these Laws of Motion are found in the first. In the second book Newton deals with movement against resistance, as, say, an object moving through water. He considers, in a thoroughly practical way, after he has explained the complicated mathematics behind it, the virtues of what we now call "streamlining", the shaping of a body to minimize this resistance.

But the third book of the *Principia* is Newton's triumph. In it he demonstrates the structure of the Universe, the movement of the planets and of their satellites, shows how to find the masses of the sun and of the planets from the mass of the earth. Then he performs an astonishing feat. It was known that the axis of the earth was tilted at about  $66\frac{1}{2}$  degrees to the plane in which its orbit lay—but at the same time, though it was known this figure of  $66\frac{1}{2}$  degrees varied slightly, no one could think why. Newton proved (1) that the world was not a sphere, after all, but an "oblate spheroid" with flattened ends, and (2) that the sun's pull on this body's bulging middle, varying slightly—by an amount which he could show—as the earth moved round the sun, would result in exactly the amount of "equinoctial precession" which we have discovered takes place.

Throughout his life Newton was intensely interested in optics, and his book *Opticks*—its title spelt in the seventeenth-century way—is a classic on the subject. As we have seen, he discovered that white light was in fact a mixture of coloured lights. He made a prism, demonstrated this spectrum, proved that violet light always came at one end, red at the other. He showed exactly how much bending or refraction there was to each colour; showed that, say, a blue light separated from white through a prism and passed, by itself, through a second prism, could not be made into anything but a blue light. On the other hand, if it be passed through, *with all the other colours of the spectrum*, it became white.

All Newton's work—and three million words of it survive, even though he refused to write down much of his thinking—shows a fantastic attention to detail and an ability to sift out one important fact from a mass of trivial ones. Strangely enough, his reluctance to write it down stemmed not from modesty but from an almost pathological horror of controversy. He was horrified by the thought of becoming involved in a dispute: he knew his theories were correct, he was satisfied, he had no desire to get into an argument with men who might not agree with them.

It was only the untiring efforts of the great astronomer Edward

Halley (whose name is remembered with "Halley's Comet"), constantly reminding Newton that his discoveries must be published, which resulted in the *Principia*. Eventually Newton agreed, and dedicated the finished work—which took him little more than a year—to the Royal Society. The famous diarist Samuel Pepys was President of the Society at the time—a shrewd and influential man, but almost without scientific knowledge, and his name, rather surprisingly, is on the title page, just as prominently displayed as that of Newton, in token of the fact that the Society sanctioned the work.

It appeared in 1687, with all three "books" bound as one, and sold at six shillings a copy. It was not an easy book and Newton, who, as we have seen, hated controversy, claimed to have made it deliberately abstruse, "to avoid being bated by little smatterers in mathematics". The mathematical methods he used were those of classical geometry, which was difficult enough in those days and with which few are familiar now. The same results can be obtained more easily by using Calculus—which he invented—and many believe that he did so first and then provided a geometrical proof because he admired the methods of the ancients.

He was knighted at the age of sixty-two and lived a further twenty-three years, dying at eighty-five in Kensington and being buried in Westminster Abbey. It was not till after his death, until half a century had elapsed from the publishing of the *Principia*, that his "Newtonian Physics" began to be taught in the Universities. For years, even then, it was only the two Scottish Universities of St Andrews and Edinburgh that did so. Because the demonstrations in the book were hard to follow, many of the foremost intellects of the time had difficulty with them, and the distinguished mathematician Demoivre bought his six-shilling copy and then tore the pages apart, so that he could carry a few with him at a time, study them when he had the leisure.

All scientists, when they had mastered his sweeping theories, were united in their praise. Even Albert Einstein, who was to overthrow a large part of Newton's teaching, maintained that he himself and all the others were pygmies in comparison with the great seventeenth-century scientist.

In Pope's couplet:

*"Nature and Nature's laws lay hid in night:  
God said, Let Newton be! and all was light."*

## *The Peace of Westphalia*

### *Firmly Plants Protestantism in Europe*

IN THE history of nations there come moments when a variety of causes conjoin and combine to set up a flow of dangerously inflammatory thoughts in men's minds. One such moment was 1617, the centenary anniversary of Martin Luther's Protestant Reformation; and the peoples to be affected deeply were the Germans and Bohemians, though before the situation was resolved most of the great nations of Europe were to become involved.

The Germans of the sixteenth and seventeenth centuries had, by reason of the geographical position in which nature had placed them, been penalized by the fact that they had been cut off by this position from the colonizing enterprises which had so enriched the maritime nations of this era. As if this were not enough, they were now to suffer from a social depression arising out of a war the ferocity of which is scarcely paralleled in history. It is, indeed, no exaggeration to say that the misery which the German peasants were called upon to endure is literally indescribable. There was starvation, there was even cannibalism, and there was widespread and constant marauding. Whole villages became depopulated derelicts, and, as always happens in circumstances such as these, moral restraints were unequal to their normal tasks and gave way to wild bursts of profligacy.

At the beginning of the sixteenth century Germany had been represented in the leadership of European civilization; before the middle of the seventeenth the country was barren of literature and art, and its customs and manners had sunk to a level of barbarity equalled only by that of contemporary Moscow under the boyar successors of Ivan the Terrible.

The main cause of the degradation to which the great German empire of Charlemagne and Otto and the latter's successors was brought was religious. The counter-reformation, inspired by a lame middle-aged Basque named Inigo Lopez de Recalde, later known as Ignatius Loyola, founder of the presently powerful missionary Society of Jesus, had worked persistently and ruthlessly to destroy

the new order which the Treaty of Augsburg (1555) had instituted and which might be summed up in the sentence *Cujus regio, ejus religio*. In other words, the German princes, without interference from the Emperor, were to be allowed each in his own territory to settle the form and character of the Church, and by this principle were to be allowed to establish Protestantism within their realms, if so moved, without fear of opposition from the invariably Catholic imperial central government.

Despite this the Peace of Augsburg cannot be accounted among the great liberating documents of history. It did not give a place to those types of Protestant belief which flourished in Zurich and Geneva. Still less did it set out in clear terms the principle of religious toleration. On the other hand, it was a serviceable solution of a grave controversy, and if it did not bring religious harmony to Germany, it did keep her out of war for half a century.

By the middle of the sixteenth century it had become clear to all intelligent Catholics that the Church had become a mighty edifice of abuses. Popes recognized the need for reform but did nothing about it, until after the passage of many years of obstructions, a Council was summoned to Trent. Although it was sparsely attended and subjected to many adjournments—one of which lasted for ten years—when at last it was brought to a conclusion in 1563, the Roman Church emerged with its doctrine defined, and its discipline strengthened. The Papacy, which had entered the Council exposed to many risks, issued victorious at every point. But most important, it divided the Lutheran from the Roman world, and drew a sharp line between the Catholic and Protestant confessions, thus beginning the period of open conflict.

Now, the real strength of Protestantism in Central Europe lay in two regions separated from one another by the whole breadth of the country—in the ancient Kingdom and Electorate of Bohemia, the home of the Hussites; and in the Palatinate, that beautiful country made lush by the waters of the Rhine and Neckar, where a succession of Calvinist Electors had made of their capital, Heidelberg, a centre of Calvinist thought and trading. But the distance separating Hussite Bohemia from the Calvinist Palatinate was not the only flaw in Protestant unity. There were basic differences of belief which the various sects, particularly the main ones, found it quite impossible to reconcile.

This was how things stood then, when the Jesuit-educated Elector of Bohemia decided that in his kingdom, at all events, there should be no place for Protestants of any faction or sect. Though the

Bohemian Protestants had been powerful enough to extract from the Emperor Rudolf a Charter of Toleration, more commonly known as the Letter of Majesty (July, 1609), the succeeding Emperor, Matthias, though adhering to one interpretation of the Letter, administered it in quite the opposite sense from that intended by those who had drawn it up. A series of suppression acts set discontent bubbling, and when an even more determined Catholic Emperor than Matthias assumed the imperial purple, believing that their subsequent lot could only be worse, the Bohemian Protestants, under the leadership of a Calvinist noble, Henry Matthias of Thurn, decided on rebellion.

When a royal decree forbade Protestant assemblies, at a violent interview with the two Catholic ministers, Martinitz and Slawata—who were the chief commissioners of the royal policy—Thurn and his fellow-nobles threw the two ministers from a window of the great Hradshin fortress-palace into the moat. This incident, known as the Defenestration of Prague, was the signal for war.

Even at this point the war, which was to rage for thirty years, could have been prevented had the Lutheran Elector of Saxony and an influential block of German princes known as the Protestant Union thrown in its lot at once with the Bohemians. But the Protestant Union lacked courage and foresight, and as it maintained a strictly neutralist position, the Emperor Ferdinand interpreted this to mean that he had a free hand in dealing with the rebellious Bohemians and acted accordingly.

Now, Bohemian Protestantism, though numerically strong, had never been united. It had to have allies or perish, and it turned to the Hungarian Protestants, to the strange, barbarous Calvinist prince from Transylvania, Bethlen Gabor, to the Protestants of Austria, and to the Palatinate. Deposing Ferdinand, the Bohemians offered their crown to the Elector Palatine, or, as he was better known in England, the Palsgrave.

The Palsgrave was destined to become for the English Puritans at Westminster the personification of the continental Protestant cause. His mother was the daughter of William the Silent, his wife Elizabeth, the daughter of the reigning English king, James I. The popular idea in London was that English troops should be sent to defend the Palatinate while the Palsgrave went to rescue Bohemia.

Fortunately the often too maligned James I was on this occasion far-sighted enough to veto this proposal, for the Palsgrave, a timid young man, little more than a youth, was destined to be no great leader. He allowed himself to be crowned King of Bohemia, and

then in one sharp battle on the White Hill, a few miles from Prague, in November, 1620, he lost everything, and fled, leaving the Bohemian Protestants to the far from tender mercies of Ferdinand who was now supported not only by the Catholics of the League but by the Lutherans of Saxony also. Ferdinand determined to wipe Protestantism totally from Bohemia, and this he set about until he entirely succeeded.

Ferdinand, however, did commit one mistake. He put the Palsgrave under imperial ban and transferred the Palatinate to the Elector Maximilian of Bavaria, the leader of the Catholic League, and the successful general at White Hill.

Now, the Palatinate was the chief stronghold of Calvinism in western Germany, and though the Palsgrave deserved little of his own people and his fellow-Protestant rulers, they were not prepared to stand by and see him treated in this despotic fashion. A compromise with the Emperor was sought and obtained, but it resulted in a Catholic victory since both Bohemia and the Palatine Electorate were successfully wrested from Protestant hands.

This, naturally, could not be permitted to become a permanent arrangement, and the Calvinists in seeking to recover the vital territories looked about for allies. We have seen that one of the consequences of the Palsgrave's activities had been to throw the Lutherans of Saxony into the Catholic camp of Ferdinand—a situation which demonstrated how very deep was the cleavage in the Protestant ranks between Lutherans and Calvinists. So in their search for help, deprived of that of Saxony, the Calvinists turned to Denmark, and since King Christian was avid for Catholic plunder, he agreed to come to their aid.

While all this had been shaping in the north, important changes were also taking place in the military direction of the Catholic forces, which was now taken over by the Prince of Friedland, Albert Wenceslas von Waldstein, better known in England as Wallenstein. Wallenstein was a Bohemian noble, who had proved his powers of leadership in the Turkish wars. He had little or no religion, but he had already accrued enormous wealth from the wars and was still not satisfied. He now came forward with an offer to raise an army at his own expense for Ferdinand, on the only condition that while the artillery and munitions captured in war should go to the Emperor, all the booty should go to the troops.

The defeat of the Danes at Lutter, in Thuringia, in August 1626, and the slaying of the most outstanding of the Protestant leaders, Mansfield, during an attack which he launched with Bethlen

Gabor in the east, dealt the Protestant cause two resounding setbacks. Once more it seemed to touch rock-bottom, while, on the other hand, the victories of the Catholic Electors produced a euphoria from which sprang a natural, but, as it turned out, a very unwise belief which was eventually to react to the detriment of the imperial interest.

A large portion of the wealth of the Catholic Church in north Germany had passed, in the last sixty years or so, to the Protestants. An edict of 6 March, 1629, however, ordered the return of all the property and titles involved to their former Catholic owners. The Protestant administrators, in the face of tyrannical pressure from Wallenstein's troops, were forced to obey the edict, and very soon even Catholics began to resent the appearance of Jesuit Fathers in abbeys formerly free of the Society's influence, and more especially the rumour which soon began to circulate that Wallenstein was advocating that four rich north German bishoprics should be combined to form one new hereditary principality. The question on everyone's lips was—who was to be the new prince? And everyone believed he knew the answer.

Certainly the Catholic Maximilian of Bavaria was of this opinion. So at the Diet of Ratisbon, in July 1630, he bluntly advocated Wallenstein's dismissal; and to his, and everyone else's, surprise, got his way.

The cunning Cardinal Richelieu of France promptly seized the advantage created by this revolt. Extraordinary though it may seem, he, a Catholic, pledged financial support for a Swedish invasion of Germany aimed at restoring the fortunes of the Protestant cause.

The Swedish leader at this time was Gustavus Adolphus, the most outstanding of all Sweden's rulers. A great warrior, a skilful and ambitious statesman, and a sincere Protestant, he had spent his early manhood fighting with one aim in view—the aggrandizement of his country and the simultaneous advancement of the Protestant cause. He had already brought his highly proficient and disciplined army south of the Baltic when the momentous treaty was made with France.

In a brilliant and short campaign he won all northern Germany for the Protestants, advanced on Prague, and entered Munich having defeated the army of the Catholic League, commanded by its skilful Walloon general, Tilly. To prevent even further deterioration of the Catholic cause Wallenstein was recalled to the command of the imperial army. In the first encounter between these two great soldiers at Nuremberg, Gustavus Adolphus tasted the bitterness of



his first defeat. When they met for a second time at Lutzen, on 16 November, 1632, the Swedes lost their leader.

Though deprived of Gustavus's inspiration, the Swedes carried on the struggle under the direction of the great regent, Count Oxenstierna, who, wise statesman that he was, had already acquired full control of all Sweden's foreign policy. By diplomatic means and the full consent of Gustavus Adolphus's generals, Oxenstierna now set about an attempt to impose Swedish supremacy on northern Germany. But even he, with all his experience and wisdom, was unable to achieve this objective, and when the Swedes were defeated at Nordlingen, the Elector of Saxony brought all the Lutherans over to the imperial side. Not only did Saxony cast off his Swedish allies, but in return for a guarantee of the Protestant forms of worship and the continued enjoyment for fifty years of the lands and revenues they had taken—with Swedish help—from the Catholics, he undertook to drive the Swedes out of Austria.

It seemed at this point that a general peace could be worked out, but it was precisely now that the whole character of the conflict changed from a religious to a political one, in which the real issue was Bourbon or Hapsburg European hegemony. One feature of this phase was the Dutch resistance to Spanish attempts to overrun their republic, the English now making their only contribution to the war by helping the Dutch.

So the struggle continued until 1648, when the Spaniards, at the end of their resources, decided that for their own good they must arrange a peace with the Netherlands. This decision made a strong impact on the other powers involved, and they, realizing that their own positions were not very different from Spain's, instituted a general move towards peace. The negotiations resulted in the signing of the Peace of Westphalia.

The greater importance of the Peace undoubtedly lies in its religious aspects, though in the overall view it is clear that the contemporary political influences are faithfully mirrored. Despite the operation of ancient obstinacies, a willingness to implement the Treaty eventually emerged, and it was on this compromise that the future religious divisions of Europe were based, on principles which remained effective for many decades.

Specifically, however, the greatest success of what was a considerable achievement, was the recognition the Peace accorded to Calvinism, for from this sprang the eventual indestructibility of European Protestantism.

## *The Execution of Charles I*

### *The Catalyst that Finally Gave Britain a Constitutional Monarchy*

IN THE hundred years from the death of Queen Elizabeth in 1603 to the accession of Queen Anne in 1702, the English people evolved a system of government by Parliament with a constitutional monarch as Head of State, which for long was peculiarly English. On the Continent, the struggle for power between King, Barons, the Church, and the cities with their rights and charters ended almost everywhere in the system of Absolute Monarchy, the archetype of which was the France of Louis XIV. The King of Spain, the Holy Roman Emperor of Austria, the petty princes of Italy and Germany were equally confirmed in their divine rights, and when, in the eighteenth century, new kingdoms arose to power such as that of Prussia, the king was a despot.

In England the central event of this important part of her historical evolution was the execution of Charles I which took place in 1649. It was an event which shocked the world and indeed shocked the English people, and which came about because, during a civil war, the army which fought for the Parliament against the king had become a force on its own; it had become the expression of the extreme Puritans, the men who had fought best against the Royalists but who no more represented the feelings of the English people than the extreme Catholic Royalists around Charles I's French queen, Henrietta Maria.

Queen Elizabeth and her Tudor predecessors had exerted powers far greater than any constitutional monarch and had used, indeed, most of the methods of governing which Parliament and people rejected at the hands of the two first Stuart kings, James I and Charles I. But Elizabeth had chosen wise ministers, had never attempted to dispute the right of Parliament to sanction the raising of money, and had been careful not to offend the fierce religious passions which agitated the nation. Catholics and Puritans suffered at times, but the Crown was wise enough not to enforce too much conformity and so to drive moderate men towards extremes.

James I, "the wisest fool in Christendom", believed in the Divine Right of Kings and considered himself qualified to settle once and for all the religious divisions of his subjects. The Court was the scene of scandals; James I had favourites, the most renowned of whom was the handsome Charles Villiers, whom he made Duke of Buckingham; he mortally offended his subjects by seeking an alliance with a country which Englishmen considered their bitter enemy, Spain; and for all this he earned much dislike and, for his general inconsequence, much contempt.

His son Charles I understood his subjects as little as his father. He was a man of strong religious principles, an Anglican, a discerning patron of the arts, but of human statecraft he had no inkling. He was obstinate where he should have been pliant. Short of stature, athletic in habit, he possessed natural dignity and charm. Yet he was melancholy and moody; the great sculptor Bernini, seeing some sketches of him made by Vandyck, said that this was the most unhappy face he had ever seen.

Charles I, early in his reign, attempted to raise money without Parliament's consent, in particular funds known as Ship Money for the rebuilding of the navy which had been allowed to pass into decrepitude. This earned for the Crown the enmity of many normally staunch supporters of the royal power, including the Buckinghamshire squire, John Hampden. Charles attempted to make the Church of England and the nation conform to the most extreme High Church principles which restored some of the special judicial authority of the Bishops and Church Courts of the Middle Ages. His agent in this was Archbishop Laud, who, like his royal master, lacked both common sense and the common touch.

Thousands of English squires and yeomen were turned against the king and began to side with the extreme Puritans, with rather extraordinary sects, such as the Anabaptists, particularly strong in East Anglia, with whom they would otherwise have had little in common. Charles's quarrels with Parliament and his unsuccessful attempt to arrest the five members of the House, of whom the best known were Pym and Hampden, for alleged treasonable dealings with the Scots, still further turned the country against him.

It seemed possible to assert the power of Parliament against the king, for in 1641 Charles I had been forced to sign a Bill of Attainder, by which the Earl of Strafford, Thomas Wentworth, the king's most able and trusted minister, was executed for having conspired against the freedom of the realm. Charles's weakness at that moment made civil war inevitable, unless he renounced his pretensions.

The First Civil War, which started in 1642, was fought with moderation by both sides. There were Royalists like Lord Falkland who fought Parliament reluctantly, and there were Roundheads, as the Parliamentarians were called, such as the Earl of Essex and the Earl of Manchester, whose last wish was to abolish monarchy. At first the king, although always short of money and with the Fleet and the City of London against him, on the whole did best. England was not then a country of hedges but of open fields and, in the early stages of the war, the Royalist cavalry ran down the homespun infantry of Parliament.

But as the war went on sterner elements on the side of Parliament came to the fore. Oliver Cromwell, a Cambridgeshire squire, raised from poor farmers and townsmen of East Anglia a highly disciplined cavalry force, the New Model Army. It was fanatically religious, its officers, indeed, being chosen for their religious zeal. At Marston Moor in Yorkshire in 1644, and then at Naseby in Nottinghamshire in 1645, the king's armies, commanded by Prince Rupert, were shattered. The test of strength was virtually over after Naseby, and the king was soon obliged to surrender to the Scots, and was by them handed over to Parliament. A crucial period then began in the life of Charles I which was to last some three years, one in which all his weaknesses were revealed.

For the leaders of Parliament were more than anxious to reach an understanding with the king. They were alarmed by the domineering attitude of many of the New Model Army's leaders, by their demands for what seemed completely Utopian policies—total religious tolerance, a vote for all men. Also, they had great difficulty in continuing to pay this army. Cromwell, too, was of a mind to compromise and he held long talks with the king, whom he came to like, at Hampton Court where Charles was being held in honourable captivity.

Terms known as the Heads of Proposals were drawn up, which the king pretended he was about to accept, and which if he had accepted would have conciliated all parties. The Episcopate of the Church of England was retained though shorn of any powers of coercion; the Prayer-Book was kept for all who wished to go to the Church of England; but there was to be complete religious toleration for all except Catholics. There were to be equal electoral districts for appointing Members of Parliament and strong measures for the control of the royal power. There were to be no further penalties against those who had fought for the king.

It was a settlement of a reasonable kind and in many ways similar

to that of 1689 which the Parliament drew up after the deposition of James II. Even the queen, from France, urged Charles to accept these terms. The vast majority of Royalists and Roundheads, but for the army extremists, would have been more than willing to have agreed to them. Charles, however, had never any intention of doing so and he was confident that he could play the army against the Parliament and the Scots against both. For the Scots were even more alarmed than the Parliamentarians by the extremism of the New Model Army and the influence it seemed to be able to exert on government.

In 1648 Scottish Presbyterians and Cavaliers joined together. A Scottish army passed southwards between the Pennines and the Lancashire coast and Cavalier factions seized towns such as Colchester and Pembroke. But by the energy of Fairfax, the able commander of the army, and Cromwell, the isolated centres of revolt in England were quickly reduced and, in a running fight lasting for three days, the invading army was completely routed at Preston by Cromwell. The Second Civil War was, therefore, quickly over, but it brought about a spirit of unforgiveness and violence in the victors.

Cromwell by "the dark lantern of the spirit" now went over entirely to the side of the New Model Army. "The man of blood", Charles Stuart, must pay for his crimes, and this stern but essentially conservative man saw that he had to lead a revolution. The army demanded the trial of the king. A Colonel Pride, a former brewer's drayman who was unable to write his name, surrounded the House of Commons and prevented one hundred Members from entering and imprisoned forty-three. So finally was given the consent of Parliament to the trial of the king.

Charles was brought to trial at Westminster Hall. It was a dangerous proceeding, for most of the best and noblest parliamentarians and even the army's chief, Lord Fairfax, shrank from the impeachment of the king. The king refused with great dignity to plead, demanding constantly by what right he was being tried and what was the jurisdiction of the court. He demanded a trial by Lords and Commons in the Painted Chamber of Whitehall. "Sire," said Judge Bradshaw when the king for the third time running had refused to recognize the court, "you are before a court of justice." "I find I am before a Power," said the king. Cromwell was adamant once he had made up his mind and he cajoled, cursed, reviled those who were, at the last moment, hanging back.

Judge Bradshaw pronounced the death sentence on Charles Stuart on Saturday morning, 27 January. That afternoon Charles was removed from the Palace of Whitehall to St James's so that he could not see or hear the work of erecting the scaffold outside the banqueting house of Whitehall for his execution. He was allowed to see his two younger children who were in England, Princess Elizabeth, who the next year died of a broken heart, and his youngest son, Prince Henry. Nothing could equal the simplicity, dignity and courage of his bearing then and during the day of his death.

On Tuesday, 30 January, 1649, at around 9 a.m., he was sent for. He put on two shirts for it was an extremely cold day (the Thames was completely frozen over at that time) and he did not wish men to think he trembled from fear. He was dressed in black satin, with a short dark red cloak. His hair had turned almost white during the past year. His long beard was carefully brushed. He walked with his customary quick athletic step through St James's Park with Bishop Juxon, the Bishop of London, and Mr Herbert, both faithful friends, and waited in a room on the ground floor of the Palace. He took Communion once more.

There was no summons at eleven nor twelve, and the king, pressed to eat, took a glass of claret and a little bread to keep up his strength. It was not until two o'clock that he was taken on to the scaffold. There had been difficulty in finding the necessary two executioners; The Common Hangman indignantly refused, though offered £100, and to this day, though years later a dying man is said to have confessed he did the deed, no one is certain who cut off the king's head.

On the scaffold, the sides of which had been draped in black cloth so that no one from outside should actually see the execution, were some fifteen people, including some writers to take down the king's last words. Whitehall and all the adjacent streets were packed with dense silent crowds from Westminster to Charing Cross. Cromwell had cavalry and infantry stationed in the Park and other points in case of trouble. The king looked over the sides and realized that what he had to say would not be heard by the crowds. So he spoke quietly to those on the scaffolding, saying:

"I shall therefore speak a word unto you here. Indeed I could hold my peace very well if I did not think holding my peace would make some men think I did submit to the guilt as well as to the punishment. But I think it is my duty to God first and to my country for to clear myself both as an honest man and a good king and a good Christian."

His short speech expressed his belief that in spite of errors he might have committed he had stood for the liberty of his people. His strongly held view that "a subject and his sovereign are clean different things" was contested by many moderate men, but when he came to say why he was on the scaffold, he spoke a truth few could deny:

"If I would have given way to an arbitrary way, for to have all laws changed according to the power of the sword, I need not have come here. And therefore I tell you, and I pray God it be not laid to your charge, that I am the martyr of the people."

His last words were to Bishop Juxon who had comforted him by saying that this last stage was turbulent and troublesome but short. Charles answered: "From a corruptible to an incorruptible crown where no disturbance can be; no disturbance in the world." The block was low and Charles had to lie rather than to kneel to put his head (his hair was tucked in a nightcap) on it.

It was arranged that when the king stretched out his hands, the executioner was to strike. After a short prayer, the king stretched out his hands and the axe fell, severing his head in one blow. When the bleeding head was held up by the executioner, the shouts raised by the soldiers were drowned by an immense spontaneous groan from the huge crowd. The body was placed in a cheap deal coffin and taken into the banqueting house.

About two o'clock on the next morning, the body being watched by the Earl of Southampton and a friend, it is said that a man muffled up in a cloak came to have a look at the dead king. He sighed, shook his head and muttered, "Cruel Necessity" It was Cromwell.

*He nothing common did or mean,  
Upon that memorable scene.*

wrote the Puritan poet Andrew Marvel, some time Cromwell's secretary. It is also said of Charles: "Nothing in his life became him like the leaving of it." Charles's bearing at his trial and his death did more than redeem his errors of statecraft. His behaviour ensured that the memory which the vast majority of the English people kept of the monarchy which they had, through their internecine strife, allowed to be ended in this fashion, was one of nobility. To his followers he was the Martyr King. The English people as a whole became aware, by Charles's death, that the alternative to monarchy was the triumph of faction and lawlessness.

Owing to the genuine and essential moderation of Cromwell,

England during the eleven years of the Protectorate was efficiently governed. Cromwell's army and navy won glory for England abroad. The people had had enough of civil war and neither Royalists nor Parliamentarians had leaders who could gather men around them. Oliver was "still all", as the old song said. But the Protectorate was never for one moment considered anything but a tyranny, which in God's good time would pass. When Charles II came to the Throne in 1660, it was to the universal joy of the nation.

There was never any doubt but that the Crown was restored; there was equally no doubt that it was not the monarchy by divine right for which Charles I had stood but one which had to correspond to the freedom-loving temperament of the English people. "This government has a monarchical appearance because there is a king, but at bottom it is very far from being a monarchy," wrote the French Ambassador in London to Louis XIV. Charles II understood the rôle he had to play and was resolved, as he said, never to go on his travels again.

Under Charles's brother, James II, a man of character but, like his father Charles I, incapable of understanding the thoughts and feelings of the English people, the monarchy was again in danger when it affronted the political and religious feelings of the country. James was forced to flee the kingdom and was succeeded by William of Orange, who had married Mary Stuart, James's daughter.

With William and Mary and then with Queen Anne the rights of Parliament were triumphantly asserted, never to be seriously challenged again. But England remained a monarchy, of that there was no question, and the cause of this unquestioning acceptance was the dark deed done on 30 January, 1649, and the noble bearing of its victim.



## *Louis XIV Rules as Absolute Monarch*

### *The Greatest Age in French History*

LOUIS XIV had been King of France since 1641, when he was five. In 1661 he decided to take all power into his own hands and he created the Absolute Monarchy, a form of government which was to last in France until 1789, the time of the French Revolution. Under Louis XIV, France became the most powerful nation of Europe.

In 1660, when Charles II was restored to the throne of England to the great joy of his subjects, his cousin, Louis XIV, aged twenty-three, gave few signs of being an outstanding figure. Like his English cousin, he was much addicted to women, loved the theatre and dancing, hunting and amusements of all kinds; unlike Charles, he appeared solemn, even a little pompous, a stickler for formality; and not very intelligent. He seemed destined to preside rather than to rule.

During his minority, France had been governed by his mother, Queen Anne, and Cardinal Mazarin whom the world said was her lover. His father, Louis XIII, had entrusted the care of the kingdom to another cardinal, Cardinal Richelieu; and his renowned grandfather, Henry IV, whose reign coincided roughly with that of Queen Elizabeth, had allowed great power to his principal minister, Sully.

The French monarchy had not been very strong for nearly a hundred years. The kings of France had been chased about by Catholic and Protestant armies during the Wars of Religion at the end of the sixteenth century. Many great nobles were richer than the king and with large private armies. The Parliaments of the Provinces and also the Parliament of Paris—assemblies dominated by lawyers and great merchants—constantly challenged the royal authority.

Under Mazarin, Louis XIV had seen his palace invaded by the Paris mob, and during the Civil Wars, known as *Les Frondes*, which lasted from 1649–53, nobles and Parliaments, in constantly shifting alliances, had rebelled against Mazarin and the royal power which supported him. The king had been driven out of Paris and his

cousin *La Grande Mademoiselle*, the daughter of the Duke of Orléans, had fired the cannons of the Bastille against his army. Queen Anne and Mazarin had won in the end, but the royal power was on shaky foundations. It would be shaky so long, as Louis XIV had gradually learnt, as a minister controlled the finances of the kingdom and not the king.

Cardinal Mazarin died in 1661; everyone imagined that Louis would find another minister and that this would be Nicolas Fouquet, a vigorous and highly intelligent man of forty-five, who for many years had managed the finances of the realm under Mazarin. He had become extremely rich in doing so and, in addition to many great houses, he possessed a fortified island off the coast of Brittany with twenty-five armed whaling vessels and six warships bought from the Dutch, all sailing under his personal flag. Fouquet was allied by marriage to several great French families. He had his friends, agents and spies in every department of State, including the friar who acted as the confessor to the king's mother. Fouquet had himself made Attorney-General to the Paris Parliament, a position of considerable political power from which he could put pressure if need be on the king.

Immediately after Mazarin's death, the young king slightly surprised his Council by telling them straight away that he would be his own Prime Minister. He told the Archbishop of Rouen who asked him to whom he should refer the affairs of the Church, hitherto in Mazarin's hands, that he himself would decide them. He closely questioned Fouquet about finances and, to the astonishment of all, spent five to eight hours each day on business. Fouquet was a little uneasy for he had much to hide; but he was confident that the king's interest in a new mistress, Louise de la Vallière, would distract him in the long run from serious matters. Fouquet entertained Louis, his mother and Louis's mistress to a most magnificent fête at his new Palace at Vaux-le-Vicomte, which was full of Old Masters and tapestries of great value and had a park with long alleys and 150 fountains, with orangeries, conservatories and so on, enclosed in a gilded iron fence.

In September the king decided on Fouquet's disgrace. He travelled to Nantes in Brittany, where he presided over the Breton Parliament, and then, with many precautions because a false move could have touched off a revolt, he arranged for a Captain D'Artagnan of the Company of Musketeers to arrest Fouquet as he came to the castle of Nantes. When D'Artagnan stopped Fouquet in his sedan chair and showed him the king's warrant, Fouquet was dumbfounded.

"I thought I stood as high with the king as any man in France," he said. He was to spend the rest of his life in a fortress. The French were also dumbfounded at Fouquet's fall and the manner of it. It was then that Louis could have uttered the celebrated phrase attributed to him: "*L'Etat c'est moi*" ("I, the Monarch, am the State").

Louis XIV was able to create his régime because, tired of incessant disorder and civil war, the French people had the opposite wish of the people of England; they wanted an Absolute Monarchy capable of ruling firmly and coherently. In the nature and abilities of the young Louis the right instrument was undoubtedly to hand. With a belief in his right and duty to rule, he had all the qualities of an efficient Head of State.

Brought up under the direction of his mother, he had learnt from her the habit of careful performance of religious duties and invariable courtesy. Even as a child he had something majestic about him and as a young man there seemed to be in his countenance something calm, proud and slightly intimidating. His health was excellent. Neither his love affairs nor his constant attendance at court ever interfered with the conduct of public business; at that, he was assiduity itself.

If no genius, he had so much common sense and clarity of mind and application that it amounted to genius. His common sense made him choose good ministers, at least until the closing years of his reign, and to stick to them. Colbert was the king's principal minister from 1669 to his death in 1685. Colbert at one time or another reformed or created most sections of the administration; he codified the laws, brought into being a workable system of taxation which only failed when the king's wars became too costly and frequent, vastly improved roads, river navigation and canals, rebuilt a powerful French navy and organized French possessions in Canada, the West Indies, Madagascar and India.

But neither Colbert nor Vauban, who built the great French fortifications, nor Louvois, the organizer of the army, were ever given imposing titles. They were simply the agents of the king. With Louis's common sense went considerable cunning and an easy absorption of the Machiavellian attributes necessary to a monarch.

In dealing with people he was astonishingly self-controlled—aloof but invariably affable and polite even to those who dared to cross him. A preacher once seized the opportunity of lecturing the king when he met him in a corridor in the Palace of Versailles.

Louis contented himself with saying mildly, "My father, I like to take my share of a sermon but I do not like to have it forced on me." Once the Duke of Lauzun flew into a passion with the king. The king listened impassively; then he opened a window and threw out the stick he always carried, saying that he would be unhappy to strike a man of Lauzun's rank.

Rigorous application, common sense, ability to choose his agents, and self-control—the qualities of a professional king: "The profession of a king", he wrote, "is great, noble and delicious"; and he stated too that, in his youth, when the names of ineffective kings of France were mentioned in his presence, he felt uncomfortable.

In the character of a really great man, all his qualities seem to work together. Louis loved magnificence and pomp of which he was a central object; he had too great a taste for it, no doubt. What more natural to him than the creation of the Court of Versailles to which all the princes and nobles of France were obliged to resort for most of the year.

Versailles had also a wide political purpose. It was a gilded prison for the nobility where instead of plotting against the royal power, it scrambled for privileges and favours. Yet with all its over-elaborate ritual, its constant scandals and intrigues, the Court assembled in one place many of the most able and all the most charming men and women of the time. Some of the best music, literature, painting would not have been composed without the existence of this immense cauldron of intellectual energy, ever on the boil. To live at the Court would have been disastrous for a Molière or a Racine; to frequent it was an immense stimulus.

The nobles and courtiers imprisoned in Versailles had one use—to serve in time of war. Great generals and captains came from this elegant throng. For war was the principal occupation of *Le Grand Monarque*. Louis XIV waged war with certain well-defined objects, the security of France's frontiers by small aggrandizements of territory. Until the War of the Spanish Succession, his last war, Louis was exceptionally well served by his generals. At the beginning of his reign, Condé and Turenne led his armies and, to follow them were men such as the Marshal of Luxembourg, Catinat, Boufflers, whilst princes of the blood and the king himself, at times, took charge of the armies with remarkable success.

Louis did not make Napoleon's mistake of threatening English maritime interests. Until 1689, except for one short period when Charles II allied himself with the Dutch, France could count on the support or the friendly neutrality of England. The third of his wars,

begun against the Dutch Republic with English aid, took much longer and cost more than he had expected; yet at the Treaty of Nimwegen in 1678, Louis showed great moderation and renounced the total conquest of Belgium. He had obtained most of France's present northern frontier. Louis XIV was now at his apogee. When, in 1688, he had a serious illness, an infection of the great intestine, fervent prayers were said on his behalf by the people of France.

Men at their height are ready to decline. In 1688 Louis had to fight a coalition of England, under the realistic William III, and Holland, the Holy Roman Emperor of Austria with many German States, Sweden, Spain and Savoy. In ten years of warfare, Louis gained some of his most striking victories, yet the Treaty of Ryswick, made because all combatants were exhausted, was a semi-defeat.

France was to lose pre-eminence in the War of the Spanish Succession which began in 1701. It was a war which Louis XIV had consented to many sacrifices to avoid, even though he precipitated its outbreak by a sudden invasion of the Netherlands when he saw war was inevitable. The prize was Spain and the Spanish Empire.

The Allies, as might be expected, were not particularly united about their objects and quarrelled fiercely during the course of the war. But the Duke of Marlborough, who commanded the English armies, and Prince Eugène of Savoy, who commanded those of the Emperor of Austria, were not only great generals but born diplomats. Indeed they tricked their own governments into prosecuting the war with efficiency and to making the necessary sacrifices.

At Blenheim, fought on the Danube, where by a miracle Marlborough had conducted a British and Dutch force, the coalition won a most striking victory; the French threat to Vienna was completely shattered. After Ramillies in the Netherlands, in 1706, Marlborough was master of the Spanish Netherlands and entered Antwerp and Brussels, captured by the French at the beginning of the war. Defeated in Italy, in Spain and in Portugal, though gaining some brilliant successes in Germany, Louis XIV sued, in vain, for peace. Foolishly, the Allies were not ready to end the war.

In 1708 the French were beaten at Oudenarde and the invasion of France began. In 1709 the bloody battle of the Malplaquet, near Lille, was a draw; the French left the battlefield but the Allies had suffered far heavier losses. The fortune of France changed at the battle of Denain, followed by a victorious campaign in which was recovered all territory in France which had been lost.

The Treaty of Utrecht in 1713 gave France the first prize in the

war—a French King of Spain, but one forbidden to inherit the French throne. She lost Nice, Savoy and all her possessions in Italy and was forced to raze the fortifications of Dunkirk to the ground and to block the harbour. It was a humiliating peace but it left France still the strongest power in Europe, with all the fortified places won in the early wars intact.

The closing years of the reign of Louis XIV were sombre. Long before the close of the War of the Spanish Succession the country was exhausted. In 1709 a bitter winter killed the olive and fruit trees of southern France and ruined much of the following year's harvest; black bread was eaten at the Court of Versailles and Louis XIV had to sell much of his gold plate to finance the war and to exact ever larger sacrifices from his now grumbling people. In 1715, two years after the Treaty of Utrecht, Louis, to finance the attempt of the Pretender to overthrow George I who had succeeded Queen Anne on the English throne in 1714, had to borrow money from his nephew the King of Spain.

Life in Versailles even before the victories of Marlborough had become far less gay. The last of Louis's mistresses, Madame de Maintenon, whom he had marriedmorganatically, in her time beautiful and witty, brought a severely religious atmosphere into an already heavily formal routine. The life of the Court in Louis's last years did not appeal even to Madame de Maintenon. She wrote to a friend: "Oh that I could tell you of my trials, that I could reveal the boredom which attends the great and the difficulty they have in passing their time." Madame de Maintenon complained once to her brother of the monotony of her life with the Great King. "I cannot endure it any longer; I wish I were dead," she said. His reply to her was: "I suppose you have been promised the Almighty as a husband."

A series of domestic calamities fell on Louis. Having lost his wife when he was forty-five and his only legitimate son at the age of fifty, he was now to see his grandson and heir, the Duke of Burgundy, his Duchess and their elder son, carried to the royal vault at St Denis in April, 1712, victims of an infectious disease known as the purple fever. In less than a month more than five hundred people succumbed to this disease in Paris alone, among them many other great personages of the Court. In August, 1715, Louis's legs swelled and signs of gangrene appeared. The courtiers began to gather around the Duke of Orleans, who was to be Regent, and who was not normally one of the centres of attraction. When the king appeared to revive through the treatment of a quack, and took food,

the throng at the Duke's levée in the morning fell away. "If the king eats another mouthful", said the Duke, "we shall have no one left."

The Absolute Monarchy which Louis XIV created in 1661 was to give France peace from internal strife until 1789, when the French Revolution began. A great French historian, Jacques de Bainville, has pointed out that there were only two events at home of any importance during the whole of Louis's long reign—the arrest of Fouquet and the revocation of the Edict of Nantes in 1685 by which Louis annulled the guarantees given to the Protestants for freedom of worship by his grandfather Henry IV. It was an act performed against his better judgment for which Madame de Maintenon, with her exaggerated piety, and public opinion which disliked and envied the French Huguenots, were jointly responsible. Louis very rarely yielded either to women or public opinion; but in this case he did.

The merits of the Absolute Monarchy can be contested. It can be considered a pity that Louis's despotic form of government served as an example to Europe during the eighteenth century instead of the democratic growth which took place in England. But it must be doubted if any other form of government was capable of restoring order and stability in France.

Of the greatness of Louis's reign there can be no doubt. He made war too much, but on the whole he made it prudently, aiming at and succeeding in giving France her natural frontiers. Napoleon's gigantic conquests were quickly lost: France kept what Louis had won. Louis's achievement is not to be measured by its political or martial successes. The monarchy of Louis XIV was the framework for a great age of the French spirit in the arts, particularly literature, and sciences, and Louis himself not only provided the framework but was a man of discernment, protecting, for example, Molière and Racine against their lesser rivals and discovering the musical genius of Lully. As H. A. L. Fisher has written in his history of Europe:

"The intellectual and social prestige of the French monarchy, so far from being lowered in the eyes of its adversaries by the martial ambitions of Louis XIV, received from them an added lustre. French books were not the less read, French science not the less honoured, French fashions not the less followed because half Europe was coalesced against the French monarchy. French civilization, illustrated by the brilliance and learning of its authors, ruled supreme and gave the law to every social group which aspired to the faintest tincture of culture from the Russian border to the Atlantic Ocean."

## *The Habeas Corpus Act*

### *Guarantee of Personal Liberty*

“IN THE name of the Holy Trinity, these things do I promise to this Christian people my subjects: first, that God’s Church and all the Christian people of my realm hold true peace; secondly, that I forbid all rapine and injustice to men of all conditions; thirdly, that I promise and enjoin justice and mercy in all judgments, that the just and merciful God of his everlasting mercy may forgive us all.”

This was a coronation oath sworn by an English king, not in the twentieth nor in the eighteenth centuries, but at the end of the tenth century; and the coronation oath continued to be taken in this form for two hundred years after the Norman Conquest.

We have set it out here, because of all the coronation oaths taken by grand and petty monarchs throughout Europe in the pre-modern-history period, that is, prior to 1485, the English oath established a relationship between king and people that was not to be found anywhere else in what many called the civilized world of these times. The people were not required to support the king in all the many aspects of social activity and to receive nothing in return. If they carried out what was demanded of them to make the nation work, the king for his part undertook to see that certain rights and privileges were at all times enjoyed by them. This reciprocal arrangement was expected to function even when the king was a despotic ruler, and much would be forgiven the autocrat who saw to it that the meanest subject within his realm received full justice before the law; though as soon as he deprived men of justice his days would be swiftly numbered unless he saw the light of wisdom in good time.

That such a situation should exist in England and not so completely if at all elsewhere, derived from the rules which the Saxons devised for the smooth and successful organization of their community life. The Saxon administrators realized to the full that to obtain the best results from community life disputes between individuals must be resolved to the satisfaction of the man with right on his side, and that disturbances in a community caused by crimes such as murder and robbery must be kept to an absolute minimum if the community



life were to be allowed to develop in the essential atmosphere of confidence engendered by the protection offered to the individual by the community.

By the middle of the tenth century, the judicial structure of England had achieved an amazing measure of sophistication, particularly in the field of local administration. All England was divided into shires and in each there was a shire-court, in which the most important cases arising locally were tried. Each shire was divided into hundreds. At first the hundred represented one hundred families, but as time passed the term was transferred from the human unit to the territorial unit, that is, to the amount of territory originally held to be necessary for the support of one hundred families, and which later became a fixed region with established boundaries.

Each hundred had its court, which was exactly like the shire-court, and whether a case was heard by the hundred court or the shire-court seems to have been made by the decision of the parties, and particularly of the plaintiff. For example, a man might feel that local prejudice against him might prevent his obtaining justice from men who knew as much about him as he knew himself, and that if he could have his plaint heard by impartial dispensers he stood a better chance of succeeding.

Over and above these two courts was the supreme court of the realm, the Witenagemot. The Witenagemot was, in fact, the national assembly as well as the supreme court, and the modern British parliament still carries this double function in theory—"the High Court of Parliament at Westminster assembled"—though in practice it transfers its judicial functions to the judiciary; however, should the circumstances arise, parliament could quite legally hear, try and issue a verdict.

As president of the Witenagemot, the king represented the source of justice and the fountain-head of administration, and these two functions were delegated to the inferior courts in the sense that they were used to carry out the king's commands as affecting the welfare of the state and to mete out justice according to his laws and in his name. Thus each individual was entitled not merely to justice but to the king's justice; and in like measure each individual was bound, in return for the protection of the king's justice, to maintain the king's peace. Monarch and individual subject were, therefore, bound to one another not by ties of service (serfdom) but by abstract ties of justice and the preservation of order.

The practical steps which were now evolved to achieve the latter emphasize still further the responsibility of the individual towards

his fellows and towards the king. For maintaining local order, and punishing crime, it was the hundred court which was most frequently used. In so far as police matters were the care of the general government, the hundred court was the police-court of England. About the middle of the tenth century, King Edgar introduced a famous law for the pursuit and arrest of thieves, using the hundred as the main unit; but taxing communal responsibility to an even greater individual level than obtained hitherto, he required every man to have a *bohr*.

A *bohr* was a kind of bailee for a man's good behaviour. If a man did wrong, his *bohr* must produce him in court, and if he could not do so was required to pay the fine which the wrongdoer would have been required to pay had he submitted to justice. It was, therefore, in the *bohr*'s interest to see that his ward did not transgress, or, if he did, to make certain that he was brought to justice.

About this time, evidence emerges of the tithe. The tithe was a small group of ten or twelve men—the term itself means a tenth—who, under the leadership of a tithingman, were collectively held responsible for the capture of criminals. These two institutions later formed the basis of the Norman frankpledge system.

Besides these arrangements, the King's Peace also had a place of great importance in the development of English law. An ordinary offence or misdemeanour was a breach of the nation's peace, or the peace of the shire; but offences committed against the king, or on his property, or in his immediate vicinity, were breaches of the King's Peace, and were punished by much heavier penalties. But the King's Peace constituted a protection which might be extended to a locality, and if this extension were made, any offences committed within the locality were regarded as breaches of the King's Peace, and carried the higher penalties. In time the King's Peace was extended to the whole country and served to consolidate further the relation between the king and individual subject, by giving the latter the king's protection.

As the administration of the country and the evolution of the laws developed, this special relationship between monarch and individual in no whit weakened, and at all times the subject could look for the protection of the monarch provided he did not put himself outside the laws. Even when he infringed the law, and particularly when he was only suspected of infringing the law, he could look to the king for justice. The fact that he could do so, automatically required the king not to inflict injustice upon him. This was particularly necessary when a man was arrested on

suspicion of crime, since he might be innocent and his suffering should, in this case, be reduced to the absolute minimum by affording him speedy trial. It was when this right was denied that conflict between king and subjects speedily arose.

This situation came into being in English history when unscrupulous kings, to rid themselves of opponents, ordered their arrest on arbitrary charges and rendered them ineffective by keeping them under restraint in prison, denying them trial and thus violating their "liberty of the individual". The first outstanding example of this kind of attempt to destroy the power of the opponents of the Throne came in the reign of King John. It was one of the major complaints against him that he denied justice to many by denying them trial, and Article 36 of Magna Carta specifically dealt with this point.

It is a widespread but erroneously held view that Magna Carta originated the process known as "the writ of habeas corpus". In fact, as early as the twelfth century writs were issued to prevent imprisonment without early trial. These early writs were not known as habeas corpus, but as writs *de odio et atia*, though in effect they amounted to the same thing. What was so important about Magna Carta's provisions in this connexion was that the writ of habeas corpus should be issued gratuitously and "could not be refused".

A writ of habeas corpus was—and still is—a writ issued by a judge or a court of justice commanding the person to whom it is directed to bring the body of the person named in the writ, who is in his custody, to the court of the judge issuing the writ, or some other court, for the purpose of acquainting the court of the charges on which the prisoner has been arrested. Should the judge, hearing the answer, decide that the charges are baseless, he may order the immediate release of the prisoner, who may not again be arrested on these same charges. Nowadays, though occasional applications are made for writs of habeas corpus, the laws of England and the judicial system work so rapidly and fairly that circumstances rarely arise warranting the issue of a writ. Nevertheless, it constitutes one of the greatest safeguards of the liberty of the individual in existence, and it is still based on the monarch-subject relationship deriving from Saxon times which we described earlier.

That the Englishman has theoretically, at all events, enjoyed the right of the protection of habeas corpus from the time of Magna Carta makes him unique in this respect, at least among the peoples of Europe. In the fractious periods of English history it proved the great mainstay of the subject in his struggle against arbitrary despotism, and the Englishman appreciated this and saw to it that

he was never deprived of its protection. By the time of Charles I it was fully established as the process for checking illegal imprisonment by inferior courts or public officials, and yet it only acquired its present constitutional importance by much later legislation, whereas the struggle for its survival was at times fierce, and Magna Carta's promise that "no person shall be deprived of life, liberty or property without due process of law" has had to be firmly restated from time to time.

Naturally, even automatically, habeas corpus had to be defended against the despotism of the Stuarts, and, indeed, it was the seventeenth century which was the great age of the perfection of habeas corpus as the means of saving the citizen against arbitrary executive action. Though there had been rumblings of discontent arising out of James's attitude towards the liberty of the individual as offset by his own ardent belief in the Divine Right of Kings, it was in his successor's reign that the first determined, concrete step was taken.

Despite the fact that he had occupied the throne for less than three years, in 1628 Charles I was already seriously at loggerheads with Parliament, who took their traditional remedy of refusing to vote him funds. To raise money he demanded benevolences and forced loans, and planned to make the latter a regular method of taxation. When called upon to sign a statement that the forced loan was legal, the judges of the King's Bench refused to do so, and though payment could not, therefore, be enforced, gentlemen who refused to pay were thrown into prison and poor men were "pressed" into the army which was being formed to go and fight on the Continent.

So great was the outcry that martial law had to be enforced with some security to control the levies, and to make up for the lack of money the troops had to be quartered on the local communities, which further exacerbated the situation. While this was happening a number of knights were arrested, among whom was one named Darnel, who, with four others, sued out writs of habeas corpus in the King's Bench. Their jailer returned answer that they were held by special command of the king. The prisoners' lawyers refused to accept this answer, declaring that while the king and the Council undoubtedly had the right to make arrests, the reply to the writ must specify the exact reason for arrest, citing Magna Carta and other statutes. The judges, however, refused to admit the prisoners to bail, which was taken to mean that they upheld the king's action.

Historically speaking the judges' decision may have been correct, but it was no necessity of state—the only excuse he might sustain

for effecting arbitrary arrest—from which the king was acting, but the necessity of maintaining his illegal and unconstitutional action. The nation had been right in cutting off, one after another, the king's extra-legal means of raising revenue, so they were right in taking away an effective weapon for defeating their will in this respect. Whatever may be said of the precedents the king's opponents brought forward, their logic at least was right, and the point at issue now became: How was their desired end to be obtained?

A simple confirmation of the existing law was not satisfactory to the Commons because it would leave the king free to put his own interpretation on it. What they wanted was a statement which would make their interpretation binding on the courts. Their first reaction was to bring in a Bill which would secure this, but when the king let it be known that he would never consent to such a Bill, both Houses decided to present a Petition of Rights.

Moderating the language they had first proposed using, the Commons eventually "did humbly pray your most excellent Majesty that no man hereafter be compelled to make or yield any gift, loan, benevolence, tax, or such like charge without common consent by vote of Parliament; that no man be molested for refusal thereof; that no freeman be imprisoned without due process of law, nor detained by the king's command without being charged with anything to which they might make answer according to law". To this petition the king gave what the Commons interpreted as an ambiguous answer, and they applied for a different one. Finally, the king gave in, and replied: "*Soit droit fait come est desire*,"—Let right be done as is desired.

Another half-century was to pass, however, before habeas corpus was placed on an indisputable basis. Charles II's Chancellor, Clarendon, assumed too autocratic powers, in the Commons' view. The best way of curbing him, it was decided, would be by firmly establishing the principle of habeas corpus by embodying it in an act of parliament: so the Habeas Corpus Act was put on the statute book in 1679. At the same time, the opportunity was taken to provide for the infliction of heavy penalties on officers holding persons in custody and on judges to make a speedy return of the writ. From this time habeas corpus, and all it implied, was firmly and undeniably planted in the rights of all individual Englishmen. For the first time the individual had a definite guarantee of personal liberty, except in times of extraordinary national danger; and this guarantee he acquired long before any of his fellow-Europeans acquired the same right.

## *William III becomes King*

### *Constitutional Monarchy Established*

UNDER THE feudal system, introduced into England by the Norman Conquest of 1066, the king habitually raised the money he required for his own and the country's use by the levying of various feudal dues. As the centuries went by, however, it became increasingly evident that other forms of taxation would be needed if the life of the nation was to progress smoothly and at the same time allow for the orderly development which the passing years inevitably brought to a people as lively and strong-charactered as the English.

But as is only too clear in the mid-twentieth century, though the English recognize the need for taxation, probably more acutely and reasonably than any other people in the world—no others pay their taxes so promptly nor with less attempt to avoid them—equally they make it their business to resist the imposition of crippling taxation unless they are convinced of the dire need for it, as, for instance, in times of war. This resistance to arbitrary taxation has always been at the heart of the relationship between people and ruler, and the safeguards which became part of the means by which the people protected themselves, at the same time became part of their constitutional rights.

The beginnings of the processes may be observed in the relationship between Edward I and the emergent Parliament. By 1295, when Edward summoned his so-called Model Parliament, it had already become practice for the great council to levy the taxes which the king stated he required for his needs. But the grants made by the Parliament of 1295 did not relieve Edward of his financial troubles, which continued rather to increase because of the difficulties and the success of his war with Scotland and France. Neither barons nor commoners were as interested in the war as he, and he found it impossible to obtain by regular grants the money he needed for its continued prosecution.

In these circumstances Edward believed that he was justified by the necessity of defending the nation in levying taxes without the previous consent of Parliament, and he excused his actions in appeals

to the nation on this ground. He obtained a grant from the barons and the towns in an irregular assembly which could by no means be called a Parliament or even a great council. But as even this was not enough, he seized the wool which the merchants were on the point of exporting, handing out receipts and promises-to-pay. He also practically outlawed the clergy who had been opposing the taxes levied on them, and seized the greater part of their property.

All these exactions were a great burden on all classes of the people and it was inevitable that the general situation should sooner or later develop into a crisis between monarch and people. Action came from the barons, who made their views unquestionably plain and at the same time refused to serve him. Edward ignored both the views and the "mutiny", and went on with his preparations for crossing to Flanders with an army in the summer of 1297.

Before he set out, about the middle of August, the barons presented to the king in their own name and that of "the whole community of the land" a formal statement of their grievances which they asked the king to redress. They complained particularly of the heavy burden of taxation which reduced them to poverty, that they were not treated according to law and custom, that the provisions of Magna Carta were not observed and of the new customs duty which the king had imposed on wool.

Edward was on the point of sailing and attempted to stall. He could not reply, he said, without consulting his council, part of which was already in Flanders, and he did sail on 22 August, leaving his young son Edward as regent. It seems that Prince Edward had his father's permission to grant the barons' demands, and this he did in what has become known as the Confirmation of the Charters. Clauses 6 and 7 of this document were to have a permanent effect on the future.

After setting out the taxes which Edward had exacted, in the previous clause, clause 6 stated: "Moreover we have granted for us and our heirs, as well to archbishops, bishops, abbots, priors and other folk of holy church, as also to earls, barons and to all the community of land, that for no business from henceforth will we take such manner of aids, mises nor prises from our realm, and for the common profit thereof saving the ancient aids and prises due and accustomed"; while the following clause (relating to the new tax on wool, "the maletote") provides that the king "shall never take this nor any other without their common assent and good will; saving to us and our heirs the custom of wools, skins and leather granted before by the commonalty."

It cannot be doubted that the men who drew up the Confirmation of the Charters intended it to cover all forms of taxation, except the feudal dues. Indeed, their belief that they had done so is confirmed by the fact that every time the issue was raised in the future, this was the interpretation placed upon it. Various kings might try to avoid being bound by it by inventing new forms of revenue to which, they could argue, it did not apply, but from 1297 it was established as a fundamental law of the constitution that the king was dependent for his revenue upon grants previously made by parliament.

Even the Tudor monarchs, who were the most despotic of all English sovereigns of modern history, considered themselves bound by the principle, however much irked by it they might feel themselves to be. Elizabeth might try to line her purse with ill-gotten treasures of her mariner pirates, but she did so only to relieve herself of absolute reliance on parliament's vote of finance; and it would never have occurred to her to flout parliament on this issue, however much she might determine to impose her will in all other matters upon parliament.

By this time it had been discovered by parliament that its power to withhold financial aid from the monarch was a strong instrument in curbing the personal policies of the monarch, and it was this which underlay the struggles of the first two Stuart kings with parliament. James VI of Scotland, I of England, was something of a student and it was in the course of his delving into current philosophical writings that he came upon the arguments in favour of the Divine Right of Kings. The theory appealed to him, and he fastened on to it and was soon expressing himself in writing on the subject.

It is not strange, therefore, that when he came to the throne of England he should do so with the determination to continue the practical absolutism which the Tudors had exercised, reinforced by his conception of his own right as the particular monarch divinely selected. On the other hand, just as determined was parliament that the Tudor absolutism should come to an end; or rather, was determined that the king should be held to the law when the law existed. So, at the beginning of the seventeenth century the stage was set for one more of those active phases which punctuate the development of English constitutional progress.

At the same time, however, the particular events in which the determination of parliament expressed itself were so shaped by the action of the king that it is not possible to say that it began its fight with the Crown on the basis of any definite plan or any



preformulated end in view. Baldly, the issue was: the king was determined to continue with absolutism and parliament was determined that he should be limited by the law; and the great practical question to be solved was: would it be possible in practice to mark off a boundary line between the king's prerogative action and those things in which he must allow parliament to be supreme?

The conflict was slow in developing, and equally relentless; and it contained two main features: the strength and spirit of the Puritan party—which has risen in the reign of Elizabeth—and the state of the national finances. The financial problem which confronted the parliament at the beginning of James's reign would have been a serious one at any time, and now it was exacerbated by the king's extravagance and his complete ignorance of the value of money.

James came to the throne of England in 1603. In the following year he called his first parliament, and it was in this first parliament that the fundamental issue was expressed, though it was to take a century to develop fully. In summoning parliament the king undertook to rule that certain classes of persons of doubtful character should not be elected to the Commons and to assign to the Court of Chancery the power to determine whether his regulations in this respect had been complied with in individual cases.

Now, the offset of this would be to deprive the House of Commons of the right to decide on the qualifications of its own members. In the course of the conflict which immediately rose between the Commons and the king over the matter, the king asserted that the Commons "derived all matters of privilege from him and by his grant". To this the Commons retorted that "our privileges and liberties are our right and due inheritance, no less than our very lands and goods".

Though this was a square issue squarely drawn, it was not developed further at this time, and it was not until 1606 that financial difficulties led to action which was typical of what was to follow. The king needed money for the ordinary running expenses of the country, but instead of applying to parliament, "in the exercise of his prerogative" he raised the tax on imported currants by five shillings a hundredweight.

In the past it had been recognized that the king had the right to raise or lower import duties without consulting Parliament; but it was equally recognized that he should use this prerogative purely and solely to regulate trade and not to raise revenue, as James was doing. In the test case which was brought before the courts, the judges pronounced in the king's favour, and James, instead of

proceeding cautiously, brought in a new schedule of tariffs covering a large range of goods. For the time being parliament acquiesced, but at last realizing that this was the thin end of a wedge which must not be allowed to be driven further in, now began with slow and ponderous, but with equally irresistible, action to resist.

The conflict was fully developed by the last years of James's reign. The technique parliament used was to attack what they considered to be abuses committed by the king's advisers and ministers and to refuse to consider his requests for money. Matters were brought to a head by a petition drawn up by the House of Commons, calling attention to the alarming spread of popery and expressing the hope of a Protestant marriage for the Prince of Wales instead of a marriage with a Spanish princess which the king hoped to make in order to cement the alliance he desired.

In this petition, it must be admitted, parliament exceeded its rights and James at once came to the defence of his prerogative. He commanded the Speaker to make it known to the House "that none therein shall presume henceforth to meddle with anything concerning our government or deep matters of state," including the Spanish marriage, and declaring his right and determination to punish misdemeanours and insolent behaviour in Parliament. The Commons replied by a second petition in which they prayed the king to recognize "the ancient liberty of parliament for freedom of speech, jurisdiction and just censure", which, they asserted, was their "ancient and undoubted right and an inheritance received from our ancestors". This the king refused, but the Commons had at last come to an appreciation of what was at stake, and came out with an unqualified declaration: "That the liberties, franchises, privileges and jurisdictions of parliament are the ancient and undoubted birth-right and inheritance of the subjects of England."

It was on this note that the reign ended, and it was the defence of this principle to which the new and equally obstinate and short-sighted king was opposed and for his refusal to see sense was deprived of his head. This, as we have seen in an earlier chapter, was the chief turning-point in the eventual establishment of a constitutional monarchy.

The Commonwealth primarily represents a swing to the other extreme, ending with the absolutism of a dictatorship exceeding that which the first two Stuarts attempted to impose. This snook parliament, and when Charles II was restored it was without any constitutional guarantees whatsoever. But Charles was wise. He realized that a great constitutional change had taken place, and that

he could not resist the will of parliament beyond a certain point. By this knowledge he shaped his conduct.

During Charles II's reign parliament, step by step, consolidated its progress towards supremacy, but before the king's sudden and unexpected death it found its way blocked by the king in the matter of James II's succession, which parliament tried to prevent. Nevertheless, had it not been for Charles's secret pact with Louis which made him quite independent of parliament financially, and which allowed him to treat his last parliament with the great contempt he did, there can be little doubt that either he would have had to submit or a very serious constitutional crisis would have broken.

This, however, was to be left to James to provoke, and he did so in no uncertain fashion. Reverting to the full-blooded Divine Right theory of his namesake and grandfather, he took upon himself the right of making appointments to offices previously made by parliament. He packed the Bench, the Army, Oxford University, even the Privy Council, with his own nominees, most of whom were Catholics. In his persistence and blindness of where his obstinacy was leading him, he eventually fell foul of the English Church. The Archbishop of Canterbury and six bishops refused to read in their churches a second declaration of indulgence, and on the king's orders were arrested and their trial promoted.

Before the trial could begin, however, the birth of an heir to James brought matters to a head. Parliament, which before had been content to bide their time in the knowledge that James's Protestant daughter and her Protestant husband, William of Orange, would succeed him, was now faced with the possibility of a long line of Catholic kings being established. Without further ado they invited William to come to England to take the lead against the king. Foolishly James fled, and by doing so put an end to all chances of his direct heir ever succeeding to the English throne.

When the invitation to accept the Crown was made to William and Mary it was made on the basis "that it hath been found by experience inconsistent with the safety and welfare of this Protestant Kingdom to be governed by a Popish Prince". In other words, the succession of William and Mary's heirs would be conditional upon their being undisputed Protestants. This was the first attempt of parliament to depart from the practice of direct succession and to make the wearing of the English Crown conditional upon other considerations.

But these were not the only conditions the new monarchs were required to accept. Parliament issued a "declaration of rights" in

which it set out the arbitrary acts of James and declared each specifically illegal. This declaration was later embodied in a statute known as the Bill of Rights.

The Bill of Rights is the most interesting English historical document after Magna Carta. It sets out a series of constitutional laws which are fundamental to the British system of government, and besides this is a contract between the king and the nation. In doing this it established once and for all the supremacy of parliament. From this time onwards, though in the early phases the king still retained considerable personal powers, he could no longer act in anything touching the welfare of the realm without the consent of Parliament, and it was in this, in its broadest sense, that William III instituted the line of British constitutional monarchs. It was a relationship between king and people towards which the English system of government had been progressing from the days of Henry II.

## The Battle of Blenheim

### *An End to the Threat of French Hegemony in Europe*

WHEN Henry IV, the first Bourbon king of France, was murdered by the fanatic Ravaillac on 14 May, 1610, he was succeeded by his son Louis XIII. Since Louis was a minor, Henry's second wife, Marie de' Medici, was appointed regent, and she was content to entrust the power to Cardinal Richelieu. From 1624 to 1642, Richelieu, as the first of a long line of chief ministers, tried to subdue the great nobles of France, especially the royal princes and princesses, abolished the privileges of the Huguenots in 1628, and in 1635 launched France into the Thirty Years War against the two great Hapsburg powers, Spain and the Holy Roman Empire. While he strengthened the absolute monarchy, he failed to abolish the abuses of unequal taxation, the sale of offices and unbudgeted expenditure.

Under his successor, Cardinal Mazarin, an Italian favoured by Anne of Austria, Louis XIII's queen, during her regency for her son Louis XIV, more increased taxation and dishonest finance led to internal trouble. The revolt of the *Fronde*s, as the civil wars were known, lasted for five years, from 1648 to 1653, and during it such parliaments as existed supported the princes and clergy fighting against the crown.

The crushing of the *Fronde*s brought early glory to Louis, who, at the age of fifteen, found himself the centre of his Court's admiration. From this time, though he did not begin to exercise his personal rule directly for another six years, Louis gained more and more control over the affairs of his country, and his long reign of seventy-two years was to become one of the most glorious periods of France's history, due exclusively to the policies and actions of *Le Roi Soleil*, the Sun King.

Surrounded by such thinkers and poets as Pascal, Corneille and La Rochefoucauld, Louis lost no time in securing his personal power. Very soon he was at the centre of every national activity. A man of tremendous industry, it was no empty boast when he proclaimed "*L'Etat, c'est moi*" ("I, the Monarch, am the State").

His hand was in almost every move of European politics, planning

aggressions, arranging campaigns, buying alliances. All these matters he conducted personally, and yet he found time to oversee the building of palaces, encourage literature and the arts—this was France's Golden Age in this field—and to take his fill of pleasure.

Louis carried on a series of wars, designed to make him dictator of Europe, and it was here that he came into conflict with one of the greatest soldiers of all time, an Englishman—John Churchill, Duke of Marlborough.

Born of a good Dorset family on 24 June, 1650, as a boy Marlborough had entered the household of James, Duke of York, as a page. A few years later he became an ensign in the Guards, at sixteen saw service in Tangier, and won a colonelcy as a reward for skill and courage in the campaign in the Netherlands, where England was helping the Dutch to withstand the pressure of France. In 1678 he married Sarah Jennings, a maid-in-waiting to the Duchess of York, and the intimate friend of the Duchess's daughter Anne, later queen, a union which was to have great consequences for the brilliant soldier.

Among all the powers of Europe, England could least afford to see France assume a dictatorship of the Continent. Under England's leadership, in the reign of James II, a coalition of European powers was organized to challenge the growing threat of the Sun King. Since the only way by which French aggression might be checked was active war, English armies crossed to the Continent.

In the army of James II, John Churchill, by now Lord Churchill, held high command, but in 1688, when William of Orange landed in England, he deserted James and transferred his allegiance to William. On accepting the English crown, William created Churchill Earl of Marlborough, and after the Battle of the Boyne, at which James was finally defeated, he left the Earl in Ireland to conduct a brief campaign there.

For a time, however, Marlborough lost royal favour, because it became known that he was intriguing with the exiled James. When Mary died in 1694, and it was understood that William would be succeeded by Anne, Lady Marlborough's intimate friend, the motive for intrigue with James was removed, and William restored him to favour.

Indeed the country was desperately in need of Marlborough's genius as a soldier. During all these events the war with France had been continued, and by 1694 Louis had reached the peak of his power in Europe. The coalition powers seemed unable to prevent his establishing his autocratic rule over the whole Continent.

William had personally led the Dutch and English armies, but in 1702, when it looked as if France was on the verge of achieving her goal, events in England required his presence there, and it was Marlborough whom he appointed to take over the command during his absence.

William had not been long in England when he died as the result of being thrown from his horse, and was succeeded by Anne. The new queen confirmed Marlborough in his command, and was content to leave the whole conduct of the war to him.

Hampered at every turn by the Dutch civil commissioners, whose assent to all military operations was required, and by intrigues at home, Marlborough nevertheless succeeded in the next two years in manœuvring the French out of one position after another, until in 1704 he found his great opportunity for inflicting a major defeat upon them.

The most effective of England's allies in the struggle against France were the Austrians, whose armies were led by a soldier who, though not in quite the same rank of military genius as Marlborough, was nevertheless a leader of great dash, high reputation and wide experience. Prince Eugène, French-born, had already won several victories over the French in the War of the Spanish Succession when Austria joined the coalition.

In 1704 the French plan of campaign was to send an army to unite with their allies the Bavarians, and then march down the Danube and capture Vienna. Meeting Eugène in the Netherlands Marlborough outlined to him a plan for frustrating this French design which surprised even the experienced Eugène, who, however, readily consented to assist in its operation.

In May, Marlborough left the Netherlands, and by his first movements gave the impression that he was preparing for a campaign on the Moselle, but before his true intentions could be even suspected he swooped from the Rhine to the Danube and threw himself between the French and Vienna. Meanwhile, the French and the Bavarians, led by Marshals Tallard and Marsin, marched on Augsburg to join forces there. The two rival armies came face to face around a village near Höchstädt, actually called Blindheim, but more commonly now known as Blenheim.

The French, though aware of Eugène's presence near Höchstädt, did not know for certain whether Marlborough had joined him there, though there were rumours that he was marching to do so. Differences of opinion regarding plans broke out between the French marshals and the commander of their Bavarian ally, which

soon developed into fierce quarrels. Tallard wished to winter his troops in the fortified base at Dillingen, but the Elector would not hear of it, insisting that Eugène should be attacked before Marlborough had time to join him. Though Tallard would not agree to the latter, he did compromise to the extent of moving forward by the road across the Pulverbach marshes, and occupying the plain between Lutzingen and Blenheim.

The French had just completed this move when Marlborough arrived, and when he and Eugène, from the top of the tower of Tapfheim church, five miles away, spied upon the enemy through telescopes, what they saw decided them that here was the opportunity they had been hoping for. Yet only two men of military genius would have decided to join battle here. For Lord Orkney, one of Marlborough's best subordinate commanders, expressed the view of the most responsible officers in the English and Austrian armies when he wrote: "I confess it is entirely owing to my Lord Duke, for I declare, had I been asked to give my opinion, I had been against it, considering the ground where they were camped and the strength of the army."

The French right rested on Blenheim itself and on the Danube which flowed past it. On Tallard's insistence, the village had been fortified. The English and Austrians had their right protected by woods. Between the two armies flowed a stream called the Nebel.

At one o'clock in the morning of 13 August, 1704, Marlborough and Eugène broke camp at Münster. Crossing the Kessel Bach by pontoon bridges, which had been laid the day before, they moved westward through the night in eight columns, as silently as an army can move and enshrouded by thick mist.

When in the dawn the French saw the heads of the first columns through the mist, they were not alarmed, for they believed them to be a reconnaissance party, covering the retreat of the Allied armies from Münster to Nördlingen. Even when the mist rolled back and revealed the whole Allied Army, the French commanders still did not imagine that Marlborough had come to give battle, but that he was retreating across their front. Though this would have been a move of ludicrous madness, the French were so confident that no one would dare to attack them in their present position, that this was the only explanation they could give themselves.

By seven o'clock, however, Marlborough's real intentions were apparent even to the haughty French, and hurried orders were given to prepare to resist the Allied attack. Taken by surprise, the French commanders made serious mistakes in their order of battle,



for instead of an order adapted to the proper defence of the actual ground, the order of encampment was adopted, and this made the centre desperately weak.

From seven until midday the two armies watched one another. Until Eugène's Danish and Prussian infantry and Austrian cavalry had reached their positions on the right flank Marlborough did nothing but lay bridges of pontoon planks and faggots across the marshes of the Nebel. He also personally attended to the siting of each of his batteries of artillery, and waited until ranging shots had been fired, to make sure that each was in the best position. Short religious services were held, and the bands played popular music.

At last a messenger came with the news that Eugène was now in position. He had had some difficulty, for the way lay through marshes and woods, which had made his progress so slow.

The battle opened at one o'clock, when Marlborough sent some troops against the village of Blenheim. They reached the defences of the village, neither firing nor being fired on, but once there the French took a heavy toll of them, while the foremost English regiments desperately tried to tear down the palisades. This initial attack was a failure, though some success was achieved by some English horsemen sent up to help.

Soon Marlborough, noticing that the French had concentrated their strength on their right, discovered the fatal mistake that Tallard and Marsin had made in their dispositions—their weak centre. So ordering the attack against Blenheim to be maintained as a feint only, he turned his attention to the vulnerable point.

He called up his cavalymen, who crossed the Nebel where a stone bridge carried the high road over the stream, and where four pontoon bridges had been constructed. The French seized the moment when the English troops were in disorder after crossing, not having had time to form up, to send their own cavalry in, and in the ensuing struggle the French went through Marlborough's lines more than once.

This manoeuvre having gained no advantage after two or three hours of fighting, at five o'clock Marlborough sent about six thousand Hanoverians against the Bavarians, who held a strong point at Oberglau, a small village between the armies. The Hanoverians were also driven back in disorder and their commander was captured. Marsin, in command of the Bavarians, took advantage of this success to launch a cavalry attack against the shaken troops.

Putting himself at the head of a brigade of Danes, Marlborough led them to meet the French cavalry, and called on Eugène to help.

Eugène, whose task was to hold the Bavarians, had himself suffered a check, but despite this he hurried to the assistance of the commander-in-chief with a body of cuirassiers, who arrived in the nick of time and fell upon the flank of the French cavalry, saved the Danish brigade and so restored the battle.

By now it was six o'clock and little daylight remained. But at last all Marlborough's troops were over the Nebel. Again the French infantry opened fire, but the cavalry hesitated to charge.

The moment for the counter-stroke had arrived, and drawing up his cavalry in one great line, Marlborough sent in the last magnificent charge. Had the French advanced in like fashion, they might have withstood the assault better than they did, but they stopped "to present their fusils". Before they could fire effectively, the English were upon them.

They routed the French horse, broke up the line of infantry at the junction of the French and Bavarian armies, and drove the two allies apart. Neither from Blenheim on his right, nor from Marsin on his left could Tallard get help in time, and while he was wondering what to do he found himself a prisoner.

Marlborough now advanced on fortified Blenheim and cut off the very large body of defenders there. When this became known the Bavarian troops decided they had had enough, and they and many of the French began to retreat with haste. Before darkness fell Marlborough and Eugène were masters of the field.

Before the clash of arms had died down, Marlborough took out his writing case and wrote to his Duchess what has since become the most famous of all his letters.

Aug. 13 1704

I have not time to say more, but to beg you will give my duty to the Queen and let her know Her Army has had a Glorious Victory. Monsr. Tallard and two other generals are in my coach and I am following the rest: the bearer my Aide de Camp Coll. Parke will give Her an account of what has pass'd. I shall doe it in a day or two by another more att large.

Marlborough.

Though Blenheim did not put an end to the war with France, and several more engagements were to be fought and won by Marlborough, the battle marked the end of the threat of superiority in Europe. The sun of "Le Roi Soleil" had begun to set, and when at last peace between France and the coalition was concluded with the Treaty of Utrecht in 1713 the terms exacted were deeply humiliating. Louis survived it by only two years.

## George I—the King Who Spoke No English

### *The Beginnings of Cabinet Government*

WHATEVER may be said or thought about the status of mid-twentieth-century Britain as a world power; however much the patriot may hanker after the power and the glory of empire unregardful of the ruthlessness and often specious justification which the acquisition of it involved; however much the detractor may scoff at the reluctance to accept a second-rate rôle; only the ultimate cataclysmic event can ever expunge from the record of history the major contribution which the English have made to the right of man to order his own affairs, to govern his own political and social destiny through duly elected representatives.

The great Greek Empire, they say, gave Western civilization Philosophy; the great Roman Empire gave Western civilization Law and Roads; the English gave the world Democratic Government made to measure modern needs, a system which respects the rights of men, from lavatory attendant to Lord Great Chamberlain.

It was a system that was not thought out by men gathered round a table, met there for the purpose of drawing up a specification for government. It evolved over centuries from the interplay of human character, from the juxtaposition of weak kings and strong people, of strong kings and stubborn people, from *force majeure* and logical development, through persuasion and beheading, by design and by accident.

It was one of the latter which was directly responsible for the evolvement of two of the major features of British democratic government—the constitutional monarch and the Cabinet, which are, in fact, interlocking features. That is to say, once the Cabinet began to function automatically, the monarch surrendered his executive powers; once the monarch, in a country in which autocracy as a principle of government had been firmly rejected, ceased to attend the deliberations of his council, the council had to act. And the king thus tacitly passed the executive power to his council for one reason only—that, ignorant of their language, too stubborn, perhaps too old, to try to learn it, he could not follow their deliberations and

grew bored of sitting hour after hour not able to understand or be understood.

That such a thorough-going Teuton should become king of an Anglo-Saxon people was the result of the Englishman's inborn love for law and order, the symbol of which he liked to find in his ruler. If there was instability at the top, it tended to permeate through all the many aspects of national existence. Long experience of struggles to secure the succession had, by the eighteenth century, taught Englishmen that nothing can be more destructive of national well-being than this kind of internecine upheaval.

Their determination to avoid a repetition of the disorganization caused by the Wars of the Roses, for example, had made them prepared to look for the heir to the throne at the end of a line that might be so tenuous it only just held, provided it did stretch from a legitimate occupant of the throne whose own accession had been in the direct line. The fact that he on the end of the line might be a full-blooded foreigner did not perturb them; Henry Tudor the Welshman, James Stuart and William the Dutchman had all been foreigners. So when the father-son, or rather mother-son, descent petered out in Anne, they did not hesitate to accept the relative of the queen with the best title to descent, no matter how distant; in fact, they passed an Act of Settlement which established his title.

Born at Hanover on 28 March, 1660, the year of the Glorious Restoration, George Louis was the son of Ernest Augustus, Elector of Hanover, and Sophia, a grand-daughter of James I, and a second cousin of Anne, which made her son George Louis a second cousin once removed of the woman he would sometime succeed. The Act of Settlement of 1701 had named his mother first as successor of Anne, and in the event of Sophia predeceasing Anne had designated him.

In 1698 he had succeeded his father as Elector of Hanover, and when Anne died in 1714 was summoned to England to mount the vacant throne. The Hanoverians were by nature stolid and uninspired, and though possessing a measure of common sense, they were not well endowed intellectually. By English standards they were uncouth in manners, crude in morals, devoid of wit. George was a typical Hanoverian; nevertheless, he had the best claim to the throne of England.

He could do no harm for by 1714 it had become well-established that his advisers, though of his own choice, should be limited to the members of that party which commanded the majority in the House of Commons; ministers, therefore, who could claim to

represent the will of the largest number of Englishmen. The advantages of this arrangement were discovered by William III, and it is somewhat strange that former monarchs had not realized that by this arrangement more than any other the guaranteeing of adequate financial supply to carry on the government could be more easily achieved.

Admittedly, the Whig junta of 1697 was not the first administration to be formed from a single party. The famous Cabal administration of Charles II's reign is regarded by historians as the earliest Cabinet in English history. But it differed fundamentally from the modern concept of a Cabinet. Firstly, it had no collective unity. Its members—Clifford, Ashley, Buckingham, Arlington and Lauderdale, from the initials of whose names it derived its designation—were just five individual ministers whom the king chose and consulted as much or as little as he pleased. That they belonged to a group of politicians which professed the same views on major issues was quite fortuitous. The Cabal were responsible to the king, and not to parliament, and had little control over the legislature.

These modern characteristics of Cabinet government were slow to develop. Even by the end of William's reign they were only just emerging. Anne's reign began with a coalition government of Whigs and Tories, but by 1708 the resignation of the Tories left the ministry purely Whig. In 1710 it was supplanted by a Tory government, which remained in power until the death of Anne in 1714 brought the Hanoverians to the throne, and with them a Whig supremacy which lasted until 1770. None of these experiments between 1660 and 1714, however, can be regarded as Cabinets in the modern sense. The sovereign still framed policy, and consulted the chief ministers independently, when convenience dictated.

At this point it is necessary to consider briefly the general lines which had operated in the field of the monarch seeking and being tendered advice over the preceding centuries. To go no farther back than Henry II (1154-1189) we find the *Curia Regis*, or King's Council, already well established. It was through this Council that the king wielded his power over the country. By the middle of the following century this council had become a body composed of a wide membership, resembling more a parliament than a body of experts designed to advise the king. After the institution of parliament by Simon de Montfort, the Council continued to exist, but it was much smaller, its functions more advisory, though it retained the judicial powers of the earlier greater councils.

In effect it was a royal Council, and it continued to develop,

until by Richard II's reign (1377-1399) it had become known as the Privy Council. In this form it has continued to function down to the present day.

During the minority of Henry VI the Privy Council governed the country, while Henry VII used it merely as a sounding-board and acted upon such advice of its members as suited his own policies. From 1540 it became a regular organ of state, from which most of the existing administrative system developed. During the sixteenth and seventeenth centuries it had two main functions: it acted as a council of state, discussing and advising the Crown on all matters of policy, and taking administrative action; and secondly, reinforced by judicial and other assessors, it functioned as a court of law.

Under Henry VIII the Privy Council comprised an average of twenty members; Mary had a Council of fifty or more; Elizabeth reduced them to under twenty, at which figure the membership remained until the Restoration; then the number began to increase once more, but now began to include "inner rings", like the Cabal. But down to George I's time it was the monarch who alone, with or without advice, framed policies and ordered them to be carried out, the administrative function resting, not with the Privy Council, but with a ministry led by a Secretary of State, with other ministers to assist in overseeing that the king's commands in various more specific spheres were carried out. Only parliament could block the king's wishes, and when the party system developed, unless the king's ministers could secure the support of the majority they were liable to have a difficult time in persuading Parliament's jealous members to approve what the monarch required.

From this it clearly emerges that while the monarch was prevented by parliament from being an autocrat, he still retained considerable powers of government, and that until he was prepared to or compelled to surrender those powers, Cabinet government could not be effected. Since the main function of monarchs was to govern, there could be little likelihood of a voluntary surrender of power, and so long as the monarch recognized the final authority of government, there could be no legal reason for inflicting upon him a deprivation of power. On the other hand, should the moment arrive when the monarch was either unable or unwilling to wield his kingly power, there was in existence an instrument capable of taking over the power and exercising it in his behalf.

So when George I found the deliberations of his ministers boring because he could not understand a word they said, it was a natural development that they should take over his governmental functions

from him, for the country had to be governed; someone had to see to it that everything continued to run smoothly.

Nevertheless, the transition to Cabinet government was not a sudden development. There were obstacles traditional and practical to prevent that from happening. As always, Parliament continued to have a rooted distrust of the monarch and *ipso facto* of anyone appointed by himself to represent him; while the Privy Council was still the only recognized advisory body of the Crown. But with regard to the latter, its members were numerous and included both Whigs and Tories; it could not provide a sufficiently small or united executive; and there were no recognized means of distinguishing the members to form a Cabinet from those who were to be excluded. Even to-day the Cabinet minister takes no other oath than that which is taken by every Privy Councillor, and in the eighteenth century every Privy Councillor might claim to be consulted on matters of state.

Gradually, however, a monopoly was usurped by a small group of ministers in whom the Secretary of State confided; and George I's Secretary of State was an extraordinary man, who, had he been other than what he was in character, might not have had the influence on the development of Cabinet government that he had.

Sir Robert Walpole first entered Parliament in 1701. He was a typical, coarse-minded, hard-headed and capable country gentleman of the age, lucid and forcible, but not eloquent of speech, with a mastery of figures and a shrewd judgment of men, marred by a cynical disbelief in their possible disinterestedness. He first held office in the Whig administration of 1708 as Secretary of War. This was followed by a period of disgrace, when he was accused of corruption and falsely convicted in defiance of evidence, and placed in the Tower. But such was the character of the man, however, that two years later he was back in office, the date coinciding with the accession of George I.

After three years in opposition, the bursting of the South Sea Bubble combined with his reputation as a financier brought him back to power. By this time George had long ceased attending the meetings of his ministers, and when Walpole's brother-in-law, Lord Townshend, retired from the Secretaryship of State in 1730, Walpole almost automatically succeeded him in that office.

Walpole's policy had one supreme object—to advance the material prosperity of England, developing her commerce, keeping her at peace, and resisting all temptation to become involved in European embroilments.

He would have overborne monarchs far less amenable to having their kingly functions usurped than George. In the ministry he would brook no rival. In all but name, he was the monarch, and an autocrat at that, though a cryptic one, for he observed certain forms which still involved the king. He did not, for example, go so far as to obliterate the king's consent to the acts which he performed on the king's behalf. He was the king's First Minister in fact and in name, the first Minister of the Crown to be called Prime Minister.

For eighteen years he dominated the nation, and he got his way with parliament by a system of parliamentary corruption more methodical than his predecessors. He did not say that "every man has his price", but he acted on that doctrine as a general principle.

By the time that he was compelled to resign—after being forced to declare war on Spain—he had steadily asserted his right to choose his own colleagues in the ministry, who, in consequence, were selected from his own party, and became collectively responsible for their policy. Cabinet government had come into being, and it had come to stay.

George III attempted to break up the Cabinet unity by consulting ministers individually. The younger Pitt had great difficulty in stopping private communications on matters of policy between the king and his Chancellors. But in the course of time Pitt's views prevailed, and the Crown was reduced to the alternative of accepting or rejecting the advice of the Cabinet as a whole. This was really no choice at all so long as the Cabinet had the confidence of the House of Commons.

The result was that the advice of ministers had become the action of the Crown. Whereas the Crown used to govern by means of ministers, now ministers, united in the Cabinet, governed by means of the Crown's authority. This removed the Crown's veto on legislation since it could only be exercised on the Cabinet's advice, and the Cabinet must necessarily enjoy the confidence of the legislature. The change therefore placed the monarch above politics, and although nowadays the monarch's advice and experience are at the service of the Cabinet—and may directly affect matters of state—the ultimate responsibility belongs to the Cabinet.

The Cabinet is the pivot of the British constitution. It is not merely the supreme executive body, it is also part of the legislature, and its control of, and responsibility to, Parliament gives a greater unity to British government than is possessed by any other self-governing country not governed by the Cabinet system.



## Jethro Tull's "Horse-Hoeing Husbandry"

### *Lifting the Ancient Curse from the Land*

"WE PLOUGH the fields and scatter the good seed on the land." Most people know this old harvest hymn, but not everyone realizes that it is a couple of centuries out of date.

Farmers have long ceased to scatter the good seed on the land. It is planted in drills and the man responsible for bringing about what was the greatest revolution in agriculture was a London barrister named Jethro Tull, who became what is called a gentleman farmer at the turn of the eighteenth century. It is from his ideas and discoveries that all modern farm-sowing implements are derived.

To understand what Tull's discovery meant it is necessary to give a brief resumé of the agricultural history of Western Europe.

It is convenient to think of the history of man as beginning at the end of the last Ice Age, though his true history, of course, goes back very much further—nearly three-quarters of a million years.

When the ice finally retreated, in about 20,000 B.C., it left Western Europe a tundra upon which teemed immense herds of grass-eating animals. This vast plethora of game made it unnecessary for Palaeolithic man to till the soil. He was a hunter and he flourished on the flesh of the reindeer, bison, horse and mammoth which roamed the great plains.

He was also a considerable artist. The Magdalenian and Aurignacian cave drawings are quite remarkable for their sensitivity, virility and sophistication. Modern critics have compared them favourably with Picasso and El Greco.

The climate became warmer and the rainfall upon the rich virgin soil caused vast forests to grow where once had been plains of grass, and so the grazing herds vanished, and with them vanished the remarkable communities of hunter-artists.

The advance of the great forests all over Europe was a set-back for early man. It made him turn to agriculture. Early Western European man copied such agrarian skills of the Mediterranean and Middle Eastern civilizations which filtered across the spaces of Europe with the restless nomadic tribes.

## JETHRO TULL'S "HORSE-HOEING HUSBANDRY"

These primitive Neolithic farmers groaned under the ancient Biblical curse: "Cursed is the ground for thy sake; in sorrow shalt thou eat of it all the days of thy life. Thorns and also thistles shall it bring forth and thou shalt eat the herb of the field. In the sweat of thy face shalt thou eat bread till thou return into the ground, for out of it thou wast taken. . . . Therefore the Lord God sent him forth from the garden of Eden to till the ground from whence he was taken." (*Gen.* 3, 17-23.)

This bondage to the soil after the Eden of hunting and painting at first seemed to depress man's soul, and the dim folk-memory of that distant Eden when food was plentiful and life was sweet entered into the mythologies and religions of the early civilizations. Mankind was haunted by this legend of the happy, carefree life, when the world was young, and all was hunting and making love, and he did not have to wrest food from the reluctant and cursed soil.

Cain, the first murderer, was a tiller of the ground. He killed Abel, who bred sheep and found greater favour thereby in the sight of God, which was rather to be expected in view of the above quotation from Genesis.

And so the tillers of the soil started under a curse, and it is not surprising that agriculture got off to a bad beginning. It could hardly have been inaugurated under a more discouraging auspice.

The early history of husbandry is wrapped in mystery. Not until Greek and Roman times did it become a highly developed craft. Modern farming is founded on Roman agriculture, which spread all over Europe and the skills of which were never lost during the Dark Ages which followed the barbarian invasions. It was the towns mainly which declined or entirely vanished during those centuries. Life remained very much the same in the countryside.

However, the Roman "dry-farming" methods, which resulted in under-manuring and over-tilling, were not really suitable to the soils of the Atlantic European countries, although there was much agrarian prosperity in Romano-British times, and southern England was a great corn-producing area.

The Anglo-Saxon invaders brought a more primitive agriculture with them, but they were responsible for clearing large areas of Britain's forests and putting them under the plough. During those centuries there was a big agrarian advance, but the type of farming which evolved into the manorial system of medieval farming was by its very nature inefficient. The wide extent of Saxon agriculture was revealed in the record made by William the Conqueror in the Domesday Book.

## JETHRO TULL'S "HORSE-HOEING HUSBANDRY"

The system of crop rotation was the simplest and most primitive. Manuring was done merely by driving cattle on to the stubble after the harvest, or strewing roughage. The crops had to depend mainly upon such fertility as was inherent in the soil. Seed was scattered or planted by hand.

The yield therefore was as low as two bushels of wheat per acre in the thirteenth century, though in open-field land there was a yield of ten bushels of wheat to the acre in medieval times.

Life was hard and bitter for the medieval serf who was bound to the land and to his lord. Aelfric, the early English writer, in his Latin work, *Colloquium*, puts words into the mouth of an eleventh-century ploughman to describe his life of unremitting slavery to the soil: "Oh, my lord, hard do I toil. I go out at dawn with my oxen to the fields and yoke them to the plough. Be it never so severe a winter, I dare not hide at home for fear of my lord. All day I shall have to plough an acre or more. Oh, oh, much work it is, my lord, because I am not free."

The peasant risings and the Black Death helped to put an end to this bitter period of English agriculture.

Poverty, want and appalling privations darkened the scene in the fifteenth century, but something of a renaissance came in the following century when the introduction of Dutch agricultural techniques in England did something to lift the primeval curse from the soil. In Tudor times feudalism was at an end and the lot of the farm worker was a little easier.

The enclosure of the commonland was the subject of much controversy during these centuries. While enclosure was good for the soil itself it created great hardships, and a new class of rural poor who were deprived of their ancient rights to the commonland.

This burning question of sociology versus technology tended to overshadow the improvements in techniques which came in during the time of Charles I, when the all-important turnip was introduced into England. This new type of farming involved the growing of winter feed for cattle, and brought about a remarkable increase in production yield. But it could only be practised on enclosed farms and so there was much opposition to it. At the end of the sixteenth century wheat-land under the new system was producing anything up to 60 bushels to the acre—six times the yield of medieval times.

During the eighteenth century enclosure was seen to be the foundation of good husbandry, despite the fact that it pauperized the small peasant, but it proceeded at such a pace that it had to be controlled by parliament.

Nevertheless, despite the many advances in husbandry, eighteenth-century farming practice was still wedded to medieval procedures. It lacked the technical means of taking full advantage of the new knowledge.

The man who provided English agriculture with this new technical means was Jethro Tull (1674-1741), who came from a wealthy Berkshire family. He studied law at Oxford and was called to the Bar at Gray's Inn in 1699, but he never practised, for Tull had little interest in law. His heart was in the farmlands. His original work was to be the basis of all the improvements in cultivation during the eighteenth and early nineteenth centuries.

Tull began farming on his father's land at Howberry, near Wallingford, in 1700, and he made a scientific investigation into the question of plant nourishment. He rightly postulated that this was a fundamental question, the key to which was the nourishment of the root system of the plant, which Tull discovered was far more extensive than had hitherto been supposed. Plants must therefore, he said, be more widely spaced and the soil around them should be thoroughly broken down during growth.

Tull's system was based upon a fundamental mistake. He believed that the nourishment which the plant took from the earth was in the form of minute particles of soil. He did not believe that animal manure provided the plant with nourishment. Its sole quality, he thought, was in its fermentative action in breaking up the soil particles. He thought manure was otherwise an objectionable substance which could only tend to taint the plants which grew in it.

Plants would grow better, he said, if the soil was thoroughly broken down, not only during sowing but in the early stages of growth. For this purpose he invented two machines, the seed-drill and the horse-hoe. With these, crops could be sown in drills or rows sufficiently wide apart so that the horse, drawing the hoe, could walk without damage to the plants, and provide tillage with the hoe during almost the whole period of growth. This after-cultivation of the growing plant was the centre-point of Tull's thinking, and the practice of course is carried on to this day. His horse-hoe was just an adapted wooden plough.

In 1711 Tull went on an extended visit to the Continent to study methods of agriculture in France and Italy. He returned in 1714 and it was not until 1731 that he published his famous book *Horse-Hoeing Husbandry*.

But, although Tull is reckoned as the greatest original thinker about farming processes which England had then produced, his

theories fell upon stony ground. Very few eighteenth-century farmers were prepared to listen to his wisdom. Most of them clung to the old ways, and it was a hundred years before Tull's methods began to be generally applied.

Tull's wrong conclusions about the value of animal manure no doubt did the rest of his theory a good deal of harm. Farmers well knew from experience the fertilizing qualities of animal manure. Widely spaced plants were frequently smothered by weeds, unless Tull's second principle of thorough hoeing was followed. Thus Tull's theories fell into disrepute. He died at Hungerford on 21 February, 1741, his work unrecognized, his theories scorned, though he never lost faith in them himself.

Fortunately for English agriculture some of the great landowners in the eighteenth century were keenly interested in progressive farming. The most celebrated of these was the second Viscount Townshend.

Townshend was a statesman. He negotiated the Treaty of Utrecht, and he and his brother-in-law, Robert Walpole, held the reins of government between them. In 1730 Townshend quarrelled with Walpole and retired to his estate at Raynham in Norfolk, where he devoted his energy and intelligence, both of which were considerable, to farming.

At Raynham Townshend put Tull's theories into practice. His soil was light and poor and he used the Tull method to cultivate turnips as a field crop. He was able to winter-feed his cattle on turnips and thus improve his livestock, and also increase the fertility of his land by the practice of Tull's techniques.

"Turnip Townshend", as they called him, transformed Norfolk farming by the intelligent application of Tull's teaching. Arthur Young, an agricultural writer in the middle of the eighteenth century, discussing the work of Townshend and Tull, said that within living memory the county of Norfolk had yielded nothing but sheep-feed, but as a result of the new methods, "those very tracts of land are now covered with as fine barley and rye as any in the world and great quantities of wheat besides".

Although Tull laid the foundations for modern techniques of sowing and cultivation, a hundred years passed before his seed-drill displaced the ancient method of broadcasting—scattering "the good seed on the land".

It was at the beginning of the nineteenth century that British farming eventually adopted more efficient and scientific methods. The agrarian revolution which Tull began was not completed until

## JETHRO TULL'S "HORSE-HOEING HUSBANDRY"

nearly a hundred years after the publication of *Horse-Hoeing Husbandry*. Horse-hoeing of wheat was practised until the 1880s, when a fall in wheat prices made it uneconomic, and it is now rare. But certain crops, such as peas and beans and root crops, are still cultivated by Tull's method, though the "horse-hoe" is now usually drawn by a tractor, is multi-bladed and is called an inter-row cultivator.

The great importance of Tull lies in the fact that all modern sowing implements are founded upon the principle of his seed-drill.

These modern methods gave rise to the new style of mixed farming, balancing larger and better stock with a wider range of crops, and have enabled man finally to lift the ancient curse from the land.

## *The Fall of Quebec*

*James Wolfe Lays the Foundations of the Future Dominion of Canada*

ALTHOUGH John Cabot from Bristol reached the shores of the North American continent in 1497, and Jacques Cartier from St Malo entered the Gulf of St Lawrence in 1534, the history of Canada properly begins with the foundation of the first settlement of Europeans at Port Royal, now Annapolis, Nova Scotia, by Samuel de Champlain in 1605. Three years later he founded Quebec, a site chosen with a soldier's eye, for it stands high on the bluffs commanding the St Lawrence River.

The main motive for the settlement of the country was the fur trade, and the struggle for supremacy in Canada between the French and the British in the century and a half that followed has been described as "a fight for the possession of the skin of a rat". But French aims were not wholly commercial, and the charter of the Company of One Hundred Associates, formed in 1627 by Cardinal Richelieu to support the new settlement, assigned first place to missionary endeavour.

The earliest missionary workers and explorers—Père Marquette, the Jesuit missionary to the Indians round the Great Lakes, discovered the Mississippi—included not only the great Society of Jesus, but the Récollets, the Sulpicians and the Ursulines, all of whom are active in the province of Quebec still.

In 1613 the English from Virginia almost completely destroyed the settlement at Port Royal, and sixteen years later Quebec itself surrendered to an expedition sent out from England under David Kirke. The Treaty of St Germain-en-Laye, in 1632, restored France's former possessions to her, but the Company of One Hundred Associates had received its quietus. It gave way to a new company, the Company of the West Indies, formed in 1664, which marked its inception by sending out to Canada the first of the "bride ships".

Despite a vigorous policy of intensive immigration, the new company was no more successful in inducing the French to leave France for Canada than its predecessor had been, and in 1647 its

charter was revoked. Since 1663 the country had been governed as a royal province by a Sovereign Council of New France, and the first governor to leave a lasting mark, especially in his control of the Indians, was Louis de Buade, Comte de Frontenac.

De Frontenac had been preceded a few years earlier by Jean Talon, whose recognition of the industrial potential all around him gave a spur to commercial development. De Frontenac, an imperious ruler, met his match in the equally imperious Cardinal Laval-Montmorency, who was determined that Canada should be governed by the Church. The two men quarrelled and de Frontenac was recalled.

With his strong hand removed, the Indians rose and almost overwhelmed the colony. The massacre of the settlers at Lachine, and a later incident involving the heroism of the fourteen-year-old Madeleine de Verchères in an Iroquois attack on a fort below Montreal, are part of the great founding story of French Canada. In 1689, when de Frontenac was sent back to restore the situation, he found that the Iroquois Confederacy was not the only danger confronting him. In 1670 King Charles II of England had granted a charter to the *Governor and Company of Adventurers of England Trading into Hudson's Bay*, and the pressure of commercial rivalry from the north was beginning to be felt.

In the south, the English colonies were claiming the country round the Great Lakes, and there was a ruthless and relentless border warfare. In 1690, Sir William Phipps, sailing from Boston, captured Acadia—the Nova Scotia founded by Sir William Alexander in 1629, but surrendered under the Treaty of St Germain-en-Laye—and attempted an attack on Quebec, but was beaten off. The French, in their turn, led by D'Urberville, seized every English settlement in Newfoundland, and occupied the Hudson's Bay Company post at Port Nelson. But once again a truce was called, and the Treaty of Ryswick, in 1697, restored the status quo.

In the following year de Frontenac died. He had subdued the Iroquois and beaten back the English; and in consequence, New France might have thought herself reasonably secure. But the truce proved to be of short duration, and war with the English was renewed in 1701; and though no great change was brought about in the early stages, Sir Hovenden Walker, in 1711, made a major effort to take Quebec. Though this attempt failed, Acadia fell once more into English hands, and this time permanently, for with the victories of Marlborough behind her, when England came to the conference table in 1713 for the drawing up of the Treaty of Utrecht, she



demanding that France should renounce her claims to Hudson's Bay, Newfoundland and Nova Scotia, and this was secured by the Treaty.

The French, however, still commanded the shores of the St Lawrence, dominating the river's entrance from the fortress of Louisberg, on Cape Breton Island. In 1745, the English colonists attacked and captured this fortress in retaliation for an unexpected and, as it proved, unsuccessful French attack on Nova Scotia in the previous year. The peace of Aix-la-Chapelle in 1748, however, returned Louisberg to the French, to the English colonists' disgust.

The position at this time was that the French claimed all but the Atlantic seaboard and the English all but the valley of the St Lawrence. With claims so vague, clashes were inevitable, and it was in one of these, at Fort Duquesne, that a young officer of the Virginia militia, Major George Washington, first appeared on the stage of history.

In 1755 the most memorable event of these times occurred—the deportation of the French Acadians from Nova Scotia, a harsh measure immortalized in Longfellow's poem, *Evangeline*. A year later the Seven Years War broke out.

This struggle, between Britain, Prussia and Hanover on the one side, and France, Austria, Russia, Sweden, Saxony and finally Spain on the other, had two main aspects. In one it was a struggle by Prussia against encirclement; in the other it was a duel between France and England for the overseas empire in America and India.

The first blow was struck with the attack on Minorca, its capture by the French initiating the naval contest. The other powers remained at peace, but in the autumn of 1756 Frederick of Prussia, satisfied that Austria was only waiting to complete her preparations before launching against him her own armies and those of her allies, struck before his enemies were ready, and attacked Saxony. Saxony, however, put up a stiff resistance which compelled him to postpone the invasion of Bohemia, which was his objective.

The war in India had two phases, the conquest of Bengal, which was only indirectly connected with the quarrel with the French, and the destruction of the French power in southern India consequent upon the inability of France to send to her possessions there adequate naval and military assistance. The decisive incidents were the battle of Plassey, on 23 June, 1757, and the overthrow of the French at Wandewash, on 22 January, 1760.

Between these two events, in the simultaneous campaign against the French in North America, there occurred one of the most

brilliant exploits in British military history—the capture of Quebec by General James Wolfe.

Born at Westerham in Kent, on 2 January, 1727, in 1741 James Wolfe was commissioned in his father's corps of marines, from which he presently transferred to the 12th Regiment of Foot, with whom he fought in Flanders and in Prussia between 1742 and 1745. His military genius was early recognized, and in 1745, already a brigade-major, he fought against Prince Charles Edward, the Young Pretender, at Falkirk and Culloden.

Following a campaign in the Netherlands in 1747, he served in England and Scotland on garrison duty for several years, chiefly on account of wounds which he had received in the Netherlands at Lawfeldt. In 1757, however, he was appointed quartermaster-general to the expedition to Rochefort, and in the following year was appointed to command a brigade in America, where he gained early distinction at the siege of Louisburg, the French fortress in the mouth of the St Lawrence River.

In 1759, promoted major-general, he was given command of the force sent up the St Lawrence against Quebec. Before Wolfe's arrival in Canada the fortunes of the British had been black. Several campaigns had been fought and, though all were inconclusive, the French had proved themselves, under their commander, the Marquis de Montcalm, more than a match for the English armies. But in 1757 the incompetent ministry of Newcastle forced the king to approve a coalition in which one of the leaders was a man whom George II heartily detested—William Pitt, later to be known as Pitt the Elder, 1st Earl of Chatham. Fortunately, the new ministry was one in which "Newcastle said what he liked, and Pitt did what he liked".

There is no space here to dilate upon the political genius of Pitt, but some measure of it can be taken when it is known that by his conduct of the Seven Years War he raised Great Britain from a position of humiliation to one of world supremacy.

Pitt had taken office too late to make 1757 a year of victory, and it ended, as it had opened, in deep gloom, for the more hopeful events which had taken place in India were not yet known. In America the new British commander, the Earl of Loudon, not only seemed unable to take the measure of Montcalm, but had no inclination to make an effective effort, or indeed any effort at all.

In the first months of Pitt's ministry the Earl sailed once again to try to take Louisburg, the key to the St Lawrence and therefore to Quebec, spent six weeks at Halifax, where he set his troops planting

cabbages, found that the French fleet at Louisburg was stronger than he had expected, and sailed back to New York.

While he had been diverting himself in this way, Montcalm had come up Lake Champlain and Lake George and captured Fort William Henry. The garrison emerged from the fort to be taken to a safe place under the protection of Montcalm's troops, but his Indians fell upon them and massacred a hundred and carried off the rest as captives.

Montcalm did what he could, short of force, to restrain the Indians, but force he dared not use, because he knew that sooner or later he would need his savage allies, and that if he thwarted them now they would desert him. It must be recorded, however, that he risked his life in trying to save the victims.

Montcalm was nevertheless held to blame, and the massacre roused the British to anger. "Remember Fort William Henry" became the battle-cry from now until the end of hostilities, and its memory was still so bitter that when peace did eventually come the British for once refused to compromise, and demanded the expulsion of the French from the whole of the North American continent.

The effect of Pitt's genius now began to be felt upon the conduct of the war, and it inculcated into the troops a new spirit which had been entirely lacking before. Relying now chiefly on regular troops, he formulated a plan of campaign which was to include a triple attack, carefully timed and co-ordinated, and prepared with all his eye for detail.

Ticonderoga was to be attacked by Abercromby and Fort Duquesne by Forbes, while a new expedition under Boscawen and Amherst set sail from England in February to attack Louisburg once more. With this expedition sailed James Wolfe, aged thirty-one, as one of the three brigadiers in the attack on the fort.

The fortifications of Louisburg had cost the French the equivalent of a million pounds, and they had garrisoned it with some of their best troops. Nevertheless, it was no match for the new British troops, imbued with their new spirit and led by officers whom they trusted. By the end of July Louisburg had unconditionally surrendered.

Meanwhile, Forbes had found Fort Duquesne burnt and empty, its garrison having retreated into Canada, and Ohio abandoned by the French. But at Ticonderoga, Abercromby was not so successful. After a succession of frontal attacks he was repulsed with terrible losses. A battery would have put the French defences out of action in an hour, but Abercromby had left his guns behind. He could

have starved the garrison into submission, but he was a general of the old school, and preferred to fight to gain his objectives. His failure postponed the fall of Canada for another year.

The fall of Louisburg had made that event certain, and it was with this confidently in mind that Pitt laid his plans for 1759. Though Amherst had won considerable victories, he was not yet on the St Lawrence, which was one of the two major thrusts which Pitt had ordained for this year. The other was a combined expedition which had been sent against Quebec under the dual command of Admiral Saunders and Major-General Wolfe.

Superb seamanship brought the British up the St Lawrence to Quebec, through channels where, so a Frenchman reported, "we dare not risk a vessel of a hundred tons by night or day". But Montcalm, who knew that he could hope for no reinforcements from France, believed that he had made Quebec impregnable. When the British landed on the Isle of Orleans on 27 June, 1759, they saw, four miles to the west across the water, a city of batteries and barracks, the capital of a country of soldiers.

In the inaccessible Beauport lines, Montcalm had fourteen thousand men holding the ridge to the east which barred all access to the city. Despite everything Wolfe might do, he could not reach the Beauport lines, nor was there any way round them. He could not expect Montcalm to budge, and time was running short, because the English would have to move away before the Canadian winter set in.

Several attempts to get at the city proved costly failures, and the general "lay helpless with a fever, and full of black despair". But within a few days he was out of danger, and up again, his head filled with a last desperate plan.

For the next week a series of sudden bombardments and feint attacks kept the French permanently on the *qui vive*, but also completely mystified. Then on 6 September, with a fleet and some 3,600 men, Wolfe moved up eight miles west of the city, to Cap Rouge, where the high cliff barrier made its first dip.

The British activity convinced Montcalm that a general assault was imminent and he believed that it would be made where the River Charles flows into the St Lawrence under the city walls. But Wolfe was surveying the sheer line of cliffs to the west of Quebec, which Montcalm declared could be held with a hundred men.

On the night of 12 September, while the French general Bougainville was guarding the cliffs well to the west, and Montcalm was expecting an assault on his Beauport lines, to the east, Wolfe, with

sixteen hundred men, climbed quietly into boats, and with oars muffled rowed and drifted under cover of darkness towards the Anse du Foulon, under the shelter of the high north bank. It was a desperate plan and required superlative seamanship and good fortune if it was to succeed.

A French post challenged them, and a Highland officer replied in French that they were a convoy bringing up provisions, and the point of landing was safely reached. There, led by young Captain Howe, brother of Lord Howe, the hero of Ticonderoga, a handful of picked men hauled themselves up the cliff face, and in the first light of dawn overpowered the astonished French pickets on the summit. This done, the remainder of the British force swarmed and scrambled up the cliff face.

By the time Montcalm received the news that the British were on the plateau to the west, Wolfe was leading his men towards the city. He met Montcalm on the Heights of Abraham. Within the hour the French were on the run. But the brilliant young English general, who had planned and executed it all, had been wounded in the first exchange of shot, and "died", as Pitt put it, "in the moment when his fame began".

Though the French did not capitulate with the fall of Quebec, and only surrendered when the Seven Years War in Europe came to an end, the final outcome was never in doubt thereafter. With the peace that terminated the struggle, the French were required to withdraw completely from Canada. But not even Pitt could then estimate the vast influence on the future of mankind which the brief encounter of Wolfe and Montcalm on the Heights of Abraham was to have, an influence which has not yet been brought to full fruition.

## *Spinning Jenny*

### *The Beginning of the Machine Age*

"SUCH IS the power of Mode as we saw persons of quality dressed in India carpets—which, but a few years before, their chambermaids would have thought too ordinary for them. The chintz was advanced from being upon their floors to their backs, from footcloth to petticoat. . . ."

No less a literary giant than Daniel Defoe, journalist, novelist, pamphleteer and creator of *Robinson Crusoe*. For a consideration, he had agreed to write this, and more in similar vein, making fun of the new fashion for wearing printed Indian cloth, a fashion which was doing much harm to the English manufacturers of wool and silk.

But all Defoe's eloquence was in vain. Another writer, seeking to provide a better reason for God-fearing men and women to eschew the imported cloth, suggested no woman should wear the "tawdry, pie-spotted, flabby, low-priced thing called Callico, made by a parcel of heathens and pagans that worship the devil and work for a half-penny a day"; but no lady cared a fig whether the heathens and pagans worked for a farthing a day or nothing; the cloth was pretty—nothing else mattered. With each ship from the East, ladies appeared in brighter, more exotic "callico" and "chintz".

And so, in 1700, a law was passed, forbidding the wearing of such things. Now women faced arrest and sometimes, more alarmingly, attacks in the street from enraged woollen workers who would rush at them, tear the hated foreign cloth from their backs. Gradually, under this twin threat, women stopped wearing cotton prints and the import—as the Government had hoped—almost ceased. It occurred to men that it might be worth trying to imitate the material, in England. True, this would be of little help to the woollen and silk workers, but at least good English men and women would be used for making the cotton thread and cloth from the imported raw material, and for printing some sort of design on it.

And now there were difficulties. Cotton fibres were exceedingly hard to spin on English spinning wheels and the resulting cloth

## SPINNING JENNY

difficult to weave on English looms, which in any case were too narrow to copy the wide India prints.

And men began, at long last, to realize that their techniques, even for the manufacture of woollen cloth, had scarcely altered in three thousand years: there were frescoes and cave paintings going back at least that far, which showed men and women spinning and weaving their cloth in almost exactly the way it was still being spun and woven. Now—with the introduction of this new and difficult material—was the time to think, think hard, about new, faster, more efficient methods of making cloth.

It was John Kay, son of a wealthy clothing merchant in Lancashire, who took the first step, started the ball rolling, the shuttles flying and began the never-ending race between spinners and weavers. Within a few years, with his "Fly Shuttle" loom he would be using yarn far faster than spinners could make it: then, a little later, new methods of spinning would be making so much yarn that all the looms in England were unable to use it.

For years cloth had been made, as it is to-day, by holding, stretched and tight, a number of parallel strands of yarn, called the "warp", and threading through them, at right angles, more strands called the "weft". Before Kay, two men had been required for this: one man threading halfway across the loom, through half the warp strands and handing the end of his weft to a colleague at the other side of the loom who completed that strand of weft and did the first half of the next, and so on, painstakingly threading over and under, over and under, with his fingers.

Then someone realized that if all the alternate strands of warp, numbers one, three, five and so on, were joined to one part of the loom so that they could all be raised or lowered together, a strand of weft could be "shuttled" through, without any of the laborious threading. It was John Kay's bright thought to make a springing hammer which would hurl the weft yarn through and back again, so that only one man was required. Cloth by this method could be made far faster with one man than with two, and as there was virtually no limit to the distance the springing hammer could be made to spring, there was no limit to the width of the loom and the cloth.

Within a year of the introduction of Kay's "Fly Shuttle", weavers found they were using up yarn faster than they could buy it; they were trudging from door to door in each village, buying whatever quantities they could at whatever inflated price the home spinners cared to ask.

It was now the turn—if there was to be any real point in Kay's invention—of the spinners. Some new, better method of spinning, of making yarn from the short fibres of wool and cotton, had to be invented. For generations, ever since it had been introduced from Italy in the fourteenth century, the spinning-wheel had been slowly twisting out its spindles of thread or yarn. Then one day James Hargreaves, a weaver of Standhill, near Blackburn in Lancashire, knocked over his wife's spinning-wheel and was struck by the idea, as it lay on its side, that it could, if required, turn a number of spindles—not just one—at the same time. He began to work out the details and in 1767 he patented this "Spinning Jenny".

This was an immense step forward. Hargreaves made first a "Jenny" which would spin on to eight spindles at once, then sixteen. Soon he was able to show that a Spinning Jenny was worth "not just eight wives, but one hundred and twenty", for this was the number of spindles in his largest machine.

But Jenny had one great fault: she could spin only the soft threads of which the crosswise "weft" was made; she was incapable of making the tight, strong thread for the lengthwise "warp". Once again—a bottleneck. The weaver had to stop and wait for the old-fashioned spinning-wheel to produce the warp yarn. Yet the speeding up was enormous: of one hundred and twenty old-fashioned spinning-wheels, where sixty of these had been spinning thread for warp and the other sixty thread for weft, now all one hundred and twenty could devote their energies and their spindles to making the strong, firm warp—balanced by just one of Hargreaves's Jennies.

Four years after the birth of Jenny, Richard Arkwright of Preston—still, be it noted, in Lancashire, home of the textile industry and particularly, thanks to these new inventions, of the new cotton industry—solved the problem. Like several other pioneers in the new industry of mechanical spinning and weaving, he had no connexion with either craft: he was a barber. His pleasant task, as a personable youth, was to roam the countryside buying the long hair of country girls—so much for blonde, so much for brown, so much for black. When he had filled his cases with the precious commodity, he took it to his employer's shop in Bolton and together they made it into wigs for ladies and gentlemen of fashion. Somehow, during these wanderings, he was struck by the complaints of cloth workers about the faults of Hargreaves's Jenny and he quietly put his mind to the problem. After all, he reasoned, human hair was not all that dissimilar to cotton.



Arkwright thought in a big way: he made a machine so vast no man could operate it. Yet, if that man were to provide himself with a water-wheel or even a horse—that was it, a horse, every man should have a horse—he could be assured of spinning yarn, strong enough for both weft and warp, far more rapidly than man had done before.

It was left to the shy, retiring Samuel Crompton to make a hybrid combining the best points of "Jenny" and the "horse" spinning machine which he christened his "Mule". Crompton remembered how spinners, fearing the Hargreaves Jenny might throw them out of work (after all, it could do the work of one hundred and twenty men, even though another hundred and twenty were needed to make warp for it), had smashed the first Jenny. He wished no part in anything like this; he was a quiet, decent, God-fearing man, and so he hastily offered his machine to a manufacturer. He had spent years in its design and construction, dismantling it several times a week, hiding the pieces in the attic when he fancied he heard workers bearing down on him. Now, here it was, he was proud of it, and at the same time frightened.

The manufacturer took the machine away "to consider", and promptly made a great many copies. Crompton received nothing for his idea, until many years later, when he was able to convince the Chancellor of the Exchequer, Spencer Perceval, that the nation was profiting hugely from his work. Perceval agreed, told him that he would press for a grant of £20,000. Almost immediately afterward Perceval was assassinated, and somewhat later Crompton was granted only £5,000. He accepted it graciously—the total reward of a man whose invention was the means of livelihood of a quarter of a million people.

Edmund Cartwright's tale is much the same. He had been born in Nottinghamshire, in 1743, and though anxious to join the Navy had bowed to his parents' wishes and taken Holy Orders. His life moved smoothly, unambitiously, on, in livings scattered about the countryside of Cheshire and Leicestershire, until he elected to take a summer holiday at Matlock, in 1784, when he was forty-one. Here he met a party of Manchester mill-owners, vociferously deploring the situation whereby spinning methods so outstripped weaving.

"Then", said the Reverend Mr Cartwright, with a bright, ecclesiastical smile, "someone must invent a weaving machine."

"Don't be a fool. Can't be done."

"Why—why I might even have a go myself——"

"Get back to your pulpit, Parson. Leave men's work to men——"

Deeply offended, the parson set to work to make, within his vicarage, a weaving machine, a mechanical loom. Eventually, with the help of a carpenter, he had it completed, but when he paid a visit to a mill to see how the existing looms functioned (at the time of his invention, Cartwright had never even seen a loom) he was disturbed to discover that the old-fashioned hand loom was faster, more efficient, than his own mechanical brain-child. Undaunted, he modified his own, found it worked satisfactorily, and bought himself a small factory. Here his Automatic Loom ran happily day and night, driven at first by the exertions of a bull, then by a steam engine. Soon the Manchester mill-owners had beaten a path to its door. One of them installed a few looms as an experiment, and found that his weavers' output was exactly doubled.

Instead of increasing wages or decreasing hours, the mill-owner simply halved the payment. Within a week of this decision, he was regretting it: his mill-hands burnt down the factory.

In some alarm, the Reverend Mr Cartwright closed down his own factory and fled to London. Here he devoted himself, without much success, to inventing gadgets for the textile industry. Eventually, in 1801, when he was fifty-eight, he was given, like Crompton before him, a grant by Parliament. He was more fortunate than Crompton: his grant amounted to £10,000, and he died in 1823, well off financially, proud of the fact that factories all over the world were now using his Automatic Loom.

Invention went on. The spinning inventions of Hargreaves, Arkwright and Crompton on the one hand, and the weaving inventions of Kay and Cartwright on the other, brought on the science of cloth-making more rapidly during the second half of the eighteenth century than in the previous thousand years. But none of these men could possibly have considered the power he was releasing—a power for evil as well as good. The Machine Age began with the Fly Shuttle and the Spinning Jenny, and it is still with us, but its first years were drenched in blood. With a Jenny supplanting a hundred and nineteen spinners out of a hundred and twenty, unemployment mounted and those that remained in work found, in this buyers' market, that their labour was worth a great deal less. As this coincided with a rise in prices brought on by war, Lancashire, to name the most hard-hit area, was soon in the deepest distress.

The price of bread mounted steadily, yet the price for weaving twenty-four squares of cambric in Stockport fell from twenty-five shillings in 1802 to ten shillings in 1811. The Luddites—named after an apprentice who smashed his stocking frame in Leicester—were

soon roaming the land smashing machinery. Eventually the riots died as workers began to see that the new machinery, though it might make a few jobs unnecessary in one part of industry, was opening up new ones elsewhere—and was also making cloth and clothing unbelievably cheap.

And so, with these not very complicated machines, designed to replace tedious manipulation, the Machine Age came to England—and the world. Its effects were widespread, for though some of the machines could be satisfactorily made of wood, the larger ones had to be of metal, to stand the strain, and now a metal industry had to be organized to keep pace with the work in textiles.

The Machine Age had come—and to stay.

## *Captain Cook Rediscovered Australia and New Zealand*

### *The Way Paved for the Founding of Two New Nations*

WHEN THE American colonies seceded and declared their independence in 1783, many foreign observers believed that the event marked the end of Britain as a great power. Indeed, many in Britain held similar views. But the great difference between the disruption of the old empire and the decline in the imperial power of Holland, Spain or Portugal, for example, was that whereas in the latter cases the causes had been the fundamental ones of lost vigour and over-strained resources, Britain's vigour was unimpaired; had, indeed, never flagged; and her resources were still considerable.

Not only that, although she might have lost the greater, and certainly the most important, part of her empire of white colonists, she had become a dominant sea-power, and this rule she could not discard except by default. This was most unlikely, for few nations could boast such a sea-minded people, nor one so attracted by commerce.

Sea-power and commerce were a formidable combination when it came to directing the energy of a nation. The development of commerce inevitably and automatically led to the development of sea-skill, and by the middle of the eighteenth century the science of navigation was already greatly advanced and the necessary equipment for the undertaking of voyages of discovery at a fraction of the risk run by da Gama was available.

With the advantage of hindsight, it can clearly be seen that the new expansion was inevitable. Not only did the merchants require it, but with British rule in India firmly established by this time, a focal point of order and security had been created which was to direct British attention to the East. Yet at the time the expansion was unforeseen and uninvited.

Even before the loss of the American colonies Captain James Cook had opened the way. As one historian has described it he "called a new world into existence which in due course was to redress the

balance of the old". The earliest navigators of the Pacific, because of their unseaworthy ships and unscientific and scanty aids to navigation, had perforce to keep to the shortest routes across the great ocean from California to Manila, and these routes lay hundreds of miles to the north of Australia and New Zealand, so that they remained undiscovered when the existence of the rest of the world was known.

In the previous century Tasman had sailed round Australia, it is true, but he had gone in too wide a sweep and so remained ignorant of the eastern side of the continent. William Dampier, an Englishman, had landed on its western coast in 1688 and 1689, but in 1763 opinion was still divided as to whether or not *Terra Australis Incognita* extended unbroken to the South Pole.

Between 1764 and 1768 Commodore John Byron and Captains Wallis and Carteret had discovered a number of Pacific islands. But it was to be the greatest navigator of this new age of discovery who was to solve the riddle.

James Cook was the son of an agricultural labourer of the Cleveland district of Yorkshire, who had run away to sea. In this he was not remarkable, for many boys have run away to sea. He was unlike the great majority of the others, however, in the endowment of scientific gifts and tremendous industry which he undoubtedly possessed; for the boy of thirteen who joined the crew of a collier had somehow or other by the age of thirty risen to be the navigator of one of the King's ships.

He was with the fleet during the siege of Quebec and was given the difficult and dangerous task of taking soundings in the channel of the St Lawrence directly opposite the French encampment, and he was so outstandingly successful that the admiral commissioned him to chart the river below Quebec.

Though there is no evidence as to how the labourer's son acquired this highly specialized knowledge, he presumably gained it during his four years with the Royal Navy. But whether anyone taught him, or how he found the time, or who provided the books, is unknown. His natural aptitude must have been as extraordinary as the tireless industry which was the other outstanding feature of the character of this tall, thin, serious man of austere habits, explosive temper, who was both feared and trusted by his crews.

He sailed on his first voyage of discovery in 1768. The primary object of the expedition was to make it possible for Sir Joseph Banks, the great British naturalist who had been elected a Fellow of the Royal Society at twenty-three, and a number of other

scientists to observe the transit of the planet Venus from a Pacific island.

But the patrons of the expedition had added to Cook's instructions that when Venus had been observed he was "to prosecute the design of making discoveries in the South Pacific Ocean". These commands he faithfully carried out.

Sailing from the island on which the observations had been made, he set course first for two large islands whose existence had become known to Europeans more than a century earlier, when Tasman had marked them on his charts of the South Pacific in 1642. But Tasman had also reported that the natives of the islands of New Zealand were fighters and cannibals, and the most intractable race he had encountered in his wide wanderings.

This description of the Maoris had held back other Europeans from visiting New Zealand, and Cook was the first to do so when he circumnavigated both North and South Island in 1769, making the first accurate chart of their coastlines.

This undertaking completed, he took a westward course, and on 30 April, 1770, he reached the east coast of Australia, on which no European had hitherto set sight. On 23 August he noted in his log: "I took possession of the whole of the eastern coast by the name of New Wales," or, as he called it in a letter later, New South Wales. Banks, whose main scientific interest was botany, was so much impressed by the fertility of the country enclosing the bay in which they anchored that he suggested it should be called Botany Bay, to which Cook agreed. Banks had also made up his mind that the British must one day colonize this land.

From April to August, 1770, Cook sailed northward for two thousand miles along the coast of eastern Australia, charting it accurately as he went. He then passed through the Torres Strait, which separates Australia from New Guinea, thereby proving that the two were distinct islands. No other explorer on a single voyage before or since has added so much new territory to the known world.

Cook now returned home, but in 1772 he set out on his second voyage. In three successive summers he penetrated into the most southern parts of the Pacific, coming up to the great ice-wall. By doing so he destroyed the myth of a Southern Continent, *Terra Australis Incognita*, an allegedly earthly paradise inhabited by a highly civilized people, in which many of the most learned of European scholars had believed.

In 1776 he embarked on his third voyage, this time sailing for the North Pacific. He discovered the Sandwich group and charted

new islands, and all the time he methodically recorded in his journal the manners and customs of the strange peoples he encountered. He explored the Alaskan coast and sailed through the Bering Strait, but reached the conclusion that there was little hope of a passage through it to the Atlantic. Next summer, however, he intended to return to probe deeper into the Strait, and returned to the Sandwich Isles to winter. But before next summer came he was dead, killed in a stupid quarrel with the Sandwich islanders who had first believed him to be a god.

Besides being the first explorer to reach and chart the eastern coast of Australia, Cook had at once appreciated, as Banks had done, the fertility and promise of the country. The Dutch had long ago reached and mapped the western parts and had reported that they were barren and useless for settlement. Here in the eastern parts, Cook was convinced that he had found a new habitation for civilized mankind.

"In this extensive country", he wrote in his journal, "it can never be doubted but what most sorts of grain, fruits, roots, etc., of every kind would flourish were they once brought hither . . . and here is provender for more cattle, at all seasons of the year, than ever can be brought into the country."

These views of Cook's became quickly and widely known, for his *Voyages* became the most popular travel-book ever published. They were translated into many languages, and read by both Louis XVI and Napoleon. Yet it was not until eighteen years after Cook had first sailed into Botany Bay that New South Wales, the first Australian settlement, was founded, and the reasons why this was done when it was done sprang directly from events that had taken place in the other New World.

When the American colonies declared their independence and this was recognized by Britain, not all the colonists wished to remain associated with them. The Empire Loyalists, as they called themselves, therefore returned to the Mother Country in large numbers with the withdrawing British armies. Most of the Loyalists arrived destitute, having sunk their all in their property in America, and were in need of support and work.

This was one reason. The second was that the new States of North and South Carolina refused to receive any more British convicts sentenced to transportation, and in 1779 Sir Joseph Banks recommended to a Committee of the House of Commons that convicts should be sent to Botany Bay. Like most recommendations made to the House of Commons, this one was sat on for several years,

and in the meantime Admiral Sir George Young put forward yet another idea—why not send Empire Loyalists to Australia as well as convicts? They were experienced colonists and they would undoubtedly be able to make for themselves there the new life which they were failing to make in England.

But Pitt had no notion of founding a new nation, and though he did eventually agree to the convict project, he did not consider it equitable or just to coerce free men to go to the other side of the world, however destitute and wretched they might be on this side. And yet he must have had some subconscious vision of what the future held, for when Captain Phillip sailed in 1787 with the first expedition of 1,100 persons, of whom 750 were convicts, he was given instructions to annex the entire eastern half of Australia and the adjacent islands to the British Crown.

It is doubtful whether the convict settlement at Botany Bay would have survived but for the kind of man Captain Phillip, its first Governor, was. "The gentleman, the scholar and the seaman are combined in Captain Phillip," wrote a friend, while another, Captain Fortescue, declared to the padre who accompanied the expedition, "Upon my soul, Butler, I do believe Almighty God made Phillip on purpose for the place."

Phillip had planned and equipped his expedition well, and to this planning a great measure of the success eventually achieved must be credited. His greatest problem was the human material with which he had to work. Many of the convicts "have been brought up from infancy", he reported, "in such indolence that they would starve if left to themselves".

When he arrived in Botany Bay, the place did not appear to Phillip to be a suitable one for the founding of a settlement, and a week after reaching it, on 26 January, 1788, he broke the British flag in "the finest harbour in the world in which a thousand sail of the line may ride in the most perfect security". He named the place Sydney, after Lord Sydney, the Secretary of State responsible for the expedition.

Here he set about the difficult task of transforming his mob into a reasonable community. This he did with tact and observation. Though his discipline was strict, and his punishments could be "prompt and terrible", yet his humanity shone through all he did and was recognized by his convict charges, who frequently called him "our good Governor".

When, four years later, he was compelled to retire through ill-health, the little community had still many dangers to overcome,



but they had already surmounted the worst, yet in 1800 the British Government were seriously considering abandoning it, and were only dissuaded from doing so by Sir Joseph Banks, who once again put forward the project of allowing in free settlers. When this was done, the settlement never looked back. Coal was discovered north of Sydney, and John Macarthur imported and bred a strain of sheep which bore excellent wool. Soon New South Wales had become the leading wool-producer of the world, and by 1820 the population of the settlement had risen to twenty-three thousand, and gradually the name Australia came into general use.

As time went by, other settlements were founded, Tasmania was annexed and New Holland, and outposts set up in the west. A constant stream of settlers arrived almost monthly, and the discovery of gold in 1850 brought about a "second colonization".

So the colony grew, and by the end of the first hundred years a new nation had come into being; a new nation which, in the mid-twentieth century, has still not revealed its full potential.

And while this nation was coming to birth, in New Zealand a similar event was taking place, which, though it was characterized by a slower start, was nevertheless to achieve a success commensurate with Australia's.

In the first twenty years after Cook's third visit in 1777, British, French and Spanish ships arrived, but none stayed; at least, not for long. The first British to attempt to settle there were refugees from the more recalcitrant of the Australian convicts, who either killed one another or went native. The first serious attempt at colonization, in 1824, also failed, but in 1840 Wellington was founded, and Captain Hobbs proclaimed the sovereignty of Queen Victoria. Other settlements followed in the next decade at Nelson, Auckland and elsewhere. From this time progress was rapid, and as in the case of Australia was much stimulated by the discovery of gold. With the pacification of the native Maoris between 1860 and 1870, this new people, too, was well set on the path to nationhood.

Probably no man's dream has been so completely fulfilled as James Cook's has been. Certainly his estimate of the potentials of the great countries of the South Pacific have been fully justified; and in the coming decades will undoubtedly be exceeded, for a great future still faces New Zealand and Australia.

## *James Watt's Steam Engine*

### *Power for the Industrial Revolution*

IT WAS there all along—waiting to be used. Generations of small boys, men too, had sat fascinated, watching what they called “steam” (though it wasn’t) puff from the spout of a kettle. There is a famous engraving by J. W. Steel of the young James Watt sitting before the fire in his parents’ house at Greenock, watching in wonder, chin in hands. His mother is at the back of the room, chattering; she hasn’t noticed the lid of the kettle being prised off by steam. Only the cat and James are watching, with clouds of the white vapour swirling about them.

The picture could have been made of other young boys. Robert Boyle, Edward Somerset, Christian Huyghens, Thomas Savery, Denis Papin, Thomas Newcomen—a dozen others—could have been drawn in the same wondering attitude, all of them fascinated by the properties of this “steam”, the vapour which came off the surface of water when it boiled. All of these, and others, experimented with it: it was left to James Watt to produce the first satisfactory “steam engine”.

The early experimenters found that the substance formed when water is vaporized (by boiling, or by any other method) was not, in fact, white and wet; it was dry, colourless and transparent. Only when it had been condensed from this dry steam by a surrounding cold atmosphere did it yield the familiar white cloud incorrectly called steam. Real steam, they discovered, had strange properties, not the least being the fact that it occupied almost two thousand times the space filled by the water from which it sprang. Obviously if it were contained in a vessel, not allowed to escape, a very high pressure would build up; and no doubt this could have a useful application.

The early experimenters, though, were more interested in the pressure of the atmosphere itself and the fact that steam, if ingeniously employed, could allow them to use it. They found that by boiling a little water in a flask with a stopcock in its outlet they could drive out the air, replace it with steam. Then, by closing the

stopcock and cooling the vessel so that the steam reverted to water, they were left with a vacuum. If the stopcock were opened, air would rush in with a mighty noise as atmospheric pressure forced it in to fill up the vacuum. Nature, Aristotle had taught, three centuries before Christ, abhors a vacuum, will go to any lengths to fill it. Surely this "abhorrence" could be used to do work?

The power of the atmosphere had been dramatically shown by the German Otto von Guericke in the course of a startling experiment at Magdeburg in the seventeenth century. He made two hemispheres of copper, exactly alike and twelve feet in diameter, fitted them together to form a huge globe, with an airtight washer between the two halves. A pump was connected and air pumped from the globe. Then, in the presence of the Emperor Ferdinand, von Guericke demonstrated that a total of sixteen horses, eight harnessed in each direction, was required to pull the hemispheres apart.

At first only one horse was harnessed to each half; then a pair to each; whip them as the drivers might, the halves refused to separate. At last, with eight horses dragging at each, the two halves separated, with a sound like thunder. Von Guericke had proved that the force of the atmosphere, unopposed by a similar force inside the globe, kept the two halves together till brute strength tore them apart. Nature, with a roar, rushed in.

Robert Boyle proved that in a vacuum like this, water would boil at a lower temperature than usual. He placed some which had been allowed to cool to just below its boiling point into a sealed vessel; then by pumping out some of the vessel's air he made it boil again. Mountaineers confirmed the discovery: on high peaks, where atmospheric pressure is less than at sea-level, water boils quickly, but at well below the accepted "boiling point" of 212 degrees Fahrenheit, or 100 degrees Centigrade. An egg can be boiled a long, long time, and still remain soft.

Denis Papin went on to prove the converse, with the first "pressure cooker": his "Digester" for "softening meat and bones and extracting therefrom marrowy nourishing juices, that the most thrifty housewife declared had been abandoned as but poor prey by ye hungry dogs". He had found that if water were boiled in a stout, closed container, so that the steam, finding no exit, built up a high pressure, the temperature at which it boiled would rise far above the usual 100 degrees C. Papin's meat and bones would soon be cooking under water, yet at a higher temperature than water had ever attained.

But Papin, like others, was anxious to do more useful work with his steam than "digest" bones. He was finally able to publish the design of an engine for pumping water out of mine-shafts. The operation was slow and tedious, but it worked. A piston was forced up a vertically standing cylinder by the force of steam from water being boiled at its base. When the piston reached the top, its shaft, which projected beyond the cylinder, was hastily attached, via rope and pulley, to a bucket. The fire was then removed from under the cylinder: the water stopped boiling and the steam reverted to water, leaving a vacuum. The atmosphere, pushing against the upper side of the piston, rammed it down and at the same time raised Papin's bucket—full of water from the mine-shaft. The bucket was made large enough to carry sixty pounds of water, but the cycle of operations took a whole minute to perform.

Thomas Savery made a similar engine, but with a separate boiler. Whereas Papin and others boiled water in their cylinder, then condensed the resulting steam in the same cylinder, Savery separated the functions. Now it was no longer necessary to move the fire out from under the cylinder: one turned off the cock which let in steam from a boiler.

Men's minds were exercised so much with the problem of raising water—from mines, from wells—that they gave scant consideration to any other aspect of steam power. Savery's engine, like those before him, was used solely for pumping: in fact, it had no moving parts, merely connected its vacuum to the water in the well or mine-shaft, and sucked. It performed its cycle four times a minute.

The last great predecessor of James Watt was Thomas Newcomen. He went back to the early designs of Papin and the others, using a moving piston, but whereas they had created their vacuum by letting their vessel cool by itself, or under a shower of cold water, Newcomen hit upon the idea of a spray of cold water actually inside the cylinder. This would condense the steam quickly, without seriously cooling the cylinder. The idea, with other ingenious improvements, made the Newcomen engine a practical affair, and with the new use of cast iron in its manufacture it became possible to make very large and strong engines which were soon being shipped all over the world. One was installed at Fresnes in France and we are told that in forty-eight hours it pumped as much water, with the help of its two "engineers" from England, as had been raised in a week, by fifty horses and twenty men working in shifts, day and night.

But still this was only a pump. The development of turning this

up-and-down, pumping motion into a rotary one—or even of seeing the need to do so—was still to come.

James Watt was born in Greenock, on the Clyde estuary in Scotland, in 1736. He studied the science of instrument-making in London and then returned to Scotland to work in the scientific workshop of Glasgow University. In the University laboratory was a working model of an early Newcomen engine, and soon Watt was devoting his considerable talent as maker of fine instruments to seeing how he could improve it. He found he could make parts that fitted better, moved more easily, wasted less heat and steam—but he realized that a rethinking of the design would have to be done as well. For a start, the heat used to make steam in the earlier engines was largely wasted when that steam was either allowed to escape or condensed in the cylinder. Both methods cooled the cylinder, so that heat from the next lot of steam was wasted when it encountered the cold walls. Watt realized he must cure this.

He began by making the boiler more efficient. He enclosed it in a heat-resistant wooden cover, passed a large number of flues through it, so a greater proportion of the hot gases of combustion would be used. He lagged his steam pipe with insulating material, to stop the heat escaping. Then he made his separate condenser, to which the steam, having done its work in moving a piston, was channelled, still hot. Here it reverted to water, warming in the process the water about to be made into steam, so that less heat was required.

He built and patented his first engine—still for pumping water—in 1769, but it was not until 1774, after a long and discouraging bout of trial and error, that he was able to write his father that the “fire-engine” was at last working well, “and answers much better than any other that has been made”. By 1781 he was able to obtain another patent, setting out more improvements, including the “double-acting” principle, whereby steam was admitted to each side of the piston alternatively. By now his cylinder was kept hot by being enclosed in a “steam chest” connected to the boiler and from which steam was admitted to the cylinder by means of a slide valve. By experimenting with the opening and shutting of this valve, Watt was able to cut off the supply of steam from his boiler when the piston had travelled only a fraction of its full distance.

He showed that the “expansive” power of the steam could be profitably employed: the piston—to the amazement of his associates—would travel the whole length of its stroke on the strength of “one wee spoonful” of steam which was let in, allowed to expand.

## JAMES WATT'S STEAM ENGINE

He went on at last to develop the "rotative engine" we know to-day: converting the up-and-down motion into a rotating one. At first, not trusting the time-honoured crank of spinning machine and foot-lathe, he invented an ingenious system whereby a "planet wheel" fastened rigidly to a "connecting rod" on the end of his piston rotated—like a planet about the sun—round a central wheel, keyed to the shaft that was to be driven.

Ingenuous as this was, he discovered that the old spinning-wheel crank—which he had feared too weak for his engine—was better, and all his later engines incorporated a "crankshaft" and a "fly-wheel". One final problem bedevilled him, but he solved it quickly: an engine with constant speed was highly desirable, and yet the steam engine tended to vary speed with its load. He invented the centrifugal governor, in which the tendency of heavy iron or brass balls to fly outwards when whirled round like chestnuts on a string could be made, by a system of levers, to narrow the steam inlet and reduce speed.

The completed Watt engine, with double action, expansive working and governor, revolutionized industry. It came in time to operate the new cotton mills and also to give power to a mass of new metal- and wood-working tools. By linking the crankshaft of Watt's engine through shafting and belts to all the machinery in a workshop or factory, it could be made to operate drills, lathes and the rest of the equipment with a speed, efficiency, undreamed of.

It was left to Watt's successors in the following century, men like George Stephenson, to use this exciting new source of power in a carriage running, because of its weight, on "rails", and dragging a long line of other carriages, full of people and freight. From the Stockton and Darlington Railway, in 1827, the first to achieve this, railways proliferated over Europe and America, completely altering men's way of life, shrinking continents to oranges. The idea was developed for the "steam-ship", and oceans became ponds.

To-day, with so many factories and workshops run by electricity; radio, television, stove and washing-machine run off the main; we must still remember that most electricity is generated by steam. Despite advances in nuclear powering, and the building of generating stations near waterfalls to use the power of descending water, electricity will continue to be generated by steam for years to come. Most power stations now use the fast-running steam "turbine", in which high-pressure steam impels a device like a water-wheel: but this would have taken years longer to perfect had it not been for Watt.

## JAMES WATT'S STEAM ENGINE

The coming of his engine—The Mechanical Revolution, it has been called—gave the spur to the Industrial Revolution. Already a transition was taking place from the methods and economics of cottage industry and the domestic workshop on the one hand to larger-scale, factory production on the other; but this was hastened enormously by the advent of steam power. Coal made its contribution; it converted water into steam for the engine and also made possible metallurgical processes which allowed stronger, better, lighter engines to be built. In return, the steam engine operated the machinery of the mine so that more and more coal and iron were won from the earth.

The pace quickened: it has been said it was far too quick; that the huge increase in manufacturing spawned by the steam engine could not be kept up with by factory managements, nor by the economic systems of the world. This is true; men and women flocked into overcrowded towns to work in factories and brought about an overcrowding and concentration of misery with which we are still struggling. But this misery was the result, not of Watt's invention, but of the greed which followed it, the greed of factory owners and of peasants, of rich men and poor. Had James Watt never lived, someone else would have invented the steam engine—years later. Destiny produced this quiet, simple man, this Scottish instrument-maker, just at the moment when his engine and all that followed from it would put Britain at the head of the world. Two world wars and a changing international climate have altered this—but the work of James Watt lingers on, every time we switch on a light, take food from the fridge.

## “*The Wealth of Nations*”

### *Adam Smith and the Science of Economics*

EVERYBODY HAS heard of Adam Smith's *Wealth of Nations*, and quite a few of those who have heard about it have read it—or bits of it. By common consent, it is one of the really great books of the world, one of the books that have changed men's minds. That is what it has been doing since it was first published, getting on for two centuries ago, and that is what it is still doing now.

Wherever men and women are studying what is now called Economics, but what in Adam Smith's day and for long afterwards was known as Political Economy, the Man and his Book are sure to be mentioned, sooner or later, and sooner than later. Very likely he will be referred to as the Founder of Political Economy, and no one has a better claim to the title, even though there were plenty of writers on the subject before he put pen to paper. His book was the first really comprehensive study of the subject, and although a good many of its conclusions have become out-moded, it remains one of the classics of a subject which has become increasingly important as the years and generations have passed.

Probably only a Scotsman could have written it. Adam Smith was a Scot of Scots. He had the peculiar Scottish quality of *canniness*; he was shrewd and clever and knowing, he was for ever asking questions and he was never satisfied until he had got the answer. Little things interested him as well as big. He had an ear and an eye for out-of-the-way facts, and he stored them all up in his formidable memory, where they lay in wait until he was ready to bring them out and use them. He was clear-headed, and he generally expressed himself clearly. If there are sections and chapters in his book that are hard to understand—and there are quite a number of such—it is not because he did not know how to express himself properly but because the things he is writing about are far from easy to describe and explain.

About the man himself there is not very much to record. He was a simple man on the whole, and there was little or no exciting incident in his life. He was born in 1723, in Kirkcaldy, a small town



in Fifeshire, on the east coast of Scotland, where his father had a legal practice and held some minor posts under Government. He died before his son was born, and Adam Smith was brought up by his mother—who, it may be remarked, seems to have been the only woman he ever really loved.

As a small boy he was sent to the burgh school in Kirkcaldy, where he sat on the same bench with the laird's son and the sons of the local fishermen and colliers as was the good old-fashioned Scottish way. The education, compared with that of a present-day council school, was dull and meagre, and the boys had no exercise-books but had slates instead, which they wiped clean with their sleeves. But Adam Smith was not ungrateful; on the contrary, he insisted that the education given in such a place was far better than that which English children received at that time.

When he was fourteen he went as a student to the College or University of Glasgow, where most of the lessons were given in Latin, and the curriculum was composed of a mere handful of subjects. But already in those days Glasgow had a high reputation for scholarship, and some of the professors were first rate. The one who influenced Adam Smith most was Francis Hutcheson, who taught Moral Philosophy, which covered Ethics or the theory of right and wrong, and fifty years later he publicly referred to him as “the never-to-be-forgotten Hutcheson”. From him he learnt to take an optimistic view of the world and of human nature. Pleasure is good, so Hutcheson maintained, provided it is taken in moderation; wealth is good, because it enables you to enjoy the good things of life; and liberty is good, too—liberty to think freely, liberty to speak out what you believe to be true, liberty to act in the way that you believe to be right.

Hutcheson insisted that man is born naturally good, or at least with the seeds of goodness within him, and therefore a really wise and enlightened government will leave the individual free to develop his own abilities and interests and inclinations in his own way, with as little outside interference as is compatible with the grant of a similar liberty to others. In his heart and mind Adam Smith accepted that with the most cordial assent, and it became a keynote of his own teaching later on.

After Glasgow, he had three years as an Exhibitioner at Balliol College, Oxford, where he learnt practically nothing from the dons—whose laziness and inefficiency he ascribed to the fact that they received their fees whether they taught or not, and were not dependent, as the Scottish professors were, on what was paid them

by their students—but taught himself a very great deal from the excellent college library.

Then he returned home to his mother in Kirkcaldy, and for a year or two was uncertain what to do next. He was twenty-five and had still not made a start on a career, when he was asked to give a course of lectures in Edinburgh on English literature. Such lectures were a novelty; they “caught on”, and Smith was a hundred pounds to the good at the end of the course. In the next two winters he delivered further courses, and one at least included a survey of Political Economy, his first venture into the field of study that he was to make peculiarly his own. So successful were they that he cannot have been much surprised when he received an offer of the Chair of Logic at Glasgow, which was soon exchanged for that of Moral Philosophy, which suited him better.

Now he was in his element, and for the next thirteen years he was a Glasgow professor. Unfortunately his lectures have not been preserved, but we know that he discoursed on Natural Theology, on Ethics, and, more important, on Justice, which included a discussion of “those things which are calculated to increase the riches, the power, and the prosperity of a State”. But all the time he was learning himself, and in places very different from the college classrooms. Glasgow was still quite a small place, with a population of perhaps thirty thousand or so, but it was busy and bustling, what with the prospering trade in tobacco and sugar with the West Indies and the colonies in America. Soon after his arrival there, Adam Smith joined a club of local businessmen that met in one of the city inns for a good dinner and discussion afterwards, and from his fellow-members he soon acquired a mass of practical information on trade and industry that served him in excellent stead when he came to write his book.

He also developed into a first-rate man of business himself—notwithstanding his occasional fits of absentmindedness, such as the one that landed him one day in a tan-pit because he was so absorbed in showing a friend round that he failed to see where he was going—and was often employed on matters of college business. He had also the acumen to befriend the young James Watt, who was given a workshop on the college premises to do his experiments when the guild authorities in the town refused to recognize his qualifications.

Perhaps he would have remained a professor to the end of his days if he had not come to the notice of the guardian of the young Duke of Buccleuch, who was looking for a completely reliable person to accompany his ward on the “Grand Tour” of the Con-

minent. The choice fell on Adam Smith, and an excellent one it proved, both for him and for his young charge. For some two years they were in France together, most of the time in Paris, where Smith seized the opportunity of meeting the French *philosophes*, who were then producing the most advanced ideas on not only politics but economics. Of these the man who interested him most was Quesnay, who was generally recognized as the chief of that group of thinkers who called themselves *economistes*, although they came to be better known under the name of Physiocrats.

This word comes from the Greek words for “nature” and “rule”, and it was given to them because they believed that there is in society a natural order, something that belongs to the essential nature of things, and that this natural order should be left full play in human affairs. They were strongly opposed to Government intervention in industry and commerce, as being “unnatural”. Leave men alone to do their jobs as they think best, they urged; and one of their number coined a phrase which became their watchword and passed into common use: *Laissez faire, laissez passer*, or more shortly, *laissez faire*, which may be rendered freely as “Let things alone—don’t meddle”.

This principle was directly opposed to the generally accepted ideas in economics and politics. The rulers of the France of the *ancien régime* (and, it should be said, of Britain and most of the other European countries) were guided by quite contrary ideas. The accepted ideology was what is known as Mercantilism, or the Mercantile System, of which the distinguishing feature was a profound belief in the virtues of State control of all economic processes and the protection of chosen industries by government action. Quesnay and his associates took the opposite view, but in their thinking was mixed a good deal of highly doubtful speculation. On the whole, Adam Smith sided with them, but only with considerable reservations. But the experience was invaluable to him, the daring ideas, the good talk, the chance of meeting the great ones of the world, the clash of nimble minds and exotic characters.

Already his book was taking shape in his mind, and after his return to Kirkcaldy in 1767 he devoted himself to writing and revising it. At length it was published in 1776, under the title, *An Inquiry into the Nature and Causes of the Wealth of Nations*. Although it sold only reasonably well to begin with, it soon “caught on”, and was highly praised by all the leaders of opinion.

Four editions appeared in Smith’s lifetime, and innumerable editions and translations have appeared since. Few books, indeed,

have been so praised by successive generations of readers, and one historian of the last century, H. T. Buckle, went so far as to assert that it was “probably the most important book that has ever been written”, and that “this solitary Scotchman has, by the publication of one single work, contributed more towards the happiness of man, than has been effected by the united abilities of all the statesmen and legislators of whom history has preserved an authentic account”.

Praise indeed, and yet not so extravagant as might appear. While as a book it leaves a good deal to be desired—it is untidy and disorderly and full of digressions (which are yet very interesting)—it is grand in its conception and profoundly convincing in its argument. To summarize it in a few words is impossible, but at least we may give some indication of its drift.

To begin with, there is Smith's conception of wealth. Most of his contemporaries, if asked what the wealth of the country consists of, would have come up with something about money in the bank or investments or landed property, but Smith insisted that the real wealth of a country is what its workers produce in the course of a year. As he saw it, a wealthy country is one in which there is sufficient of the “necessaries and conveniences of life” to go round; and he went on to urge that: “No society can surely be flourishing and happy of which the far greater part of the members are poor and miserable. It is but equity, besides, that they who feed, clothe, and lodge the whole body of the people, should have such a share of the produce of their own labour as to be themselves tolerably well fed, clothed, and lodged.”

Wealth, then, consists of goods, and goods of whatever kind are the product of human labour and ingenuity and skill. Together they constitute a “fund”, and clearly the bigger the fund in proportion to the number who are to share in it, the better it will be for all concerned. The size of the fund depends mainly on the “skill, dexterity, and judgment” with which the labour of the nation is applied, and here we come to those most interesting chapters in which Adam Smith explains the principle of Division of Labour and, from such homely illustrations as the craft of the pin-maker, shows how it works. That there are disadvantages in what we should call specialization he was quite willing to admit, but he was firmly convinced that without division of labour, modern society could not continue to exist for long, but there would be a reversion to barbarism.

Yes, it is a wonderful thing indeed, this division of labour, but don't let us fall into the error of thinking that it is the result of

human wisdom. In fact, it is owing to something that is born in us: “It is the necessary consequence of a certain propensity in human nature—the propensity to truck, barter, and exchange one thing for another.” This assertion is a reflection of Adam Smith’s conviction, that there is a “natural order” or arrangement of things that has been ordained by God from the beginning, and that man’s duty, and chance of happiness, depend on his ascertaining what this natural order is, and then co-operating with it to the full.

This brings us to another of his fundamental axioms, which likewise has a theological complexion. Every individual, he asserts, is constantly engaged in trying to better himself, to improve his station in life; but while “it is his own advantage, and not that of society, which he has in view”, matters are so arranged that “the study of his own advantage naturally, or rather, necessarily, leads him to prefer that employment which is most advantageous to society”. Or, to quote another passage, by directing his industry “in such a manner as its produce may be of the greatest value, he intends only his own gain”, but “in this, as in many other cases, he is led by an invisible hand to promote an end which was no part of his intention”.

Some of his critics have complained that this is to take a very low view of human nature, but Adam Smith did not see it in this light. The “invisible hand” was his synonym for God, and he firmly believed that to act in this way was to serve the pre-ordained purpose. We should accept this selfishness, therefore, this pursuit of self-interest, as being an essential part of the natural order, or, if you like, the Divine plan; we should avoid meddling with it, or thwarting it, and let it work its way. Leave men free to seek what they believe to be for their own good, act in the way they deem to be best, and we may be sure that the “invisible hand” will guide them to do what is best for one and all.

Moved by this guiding principle, Adam Smith urged that the apprenticeship laws should be abolished, and likewise those that hindered a worker from moving to where he might find a better job. He advocated the abolition of restrictions on trade, national and international, and he looked forward to the time when all the countries of the world would constitute one great market, united by the ties of peaceful commerce. If his economic philosophy may be summed up in the briefest fashion, it is comprised by the two terms, Competition, and Free Trade.

This was his gospel, and before long it was accepted as the policy of the country, with the most strikingly successful results. More

recently it has been abrogated, as other countries have tried to secure a state of national self-sufficiency. But there is still force in his arguments, and in the European Common Market and other similar projects he would have seen a fulfilment of his hopes.

It is getting on for two hundred years now since he died, at Edinburgh in 1790, but the most important part of him is still alive—his ideas of economic freedom and peaceful progress, his insistence on a fair deal for the workers, and, not least, his persuasion that the study of Economics is an essential part of modern life, if we are to benefit to the full from the technical improvements that have transformed, and are still transforming, this busy, stimulating, challenging and intensely interesting world of to-day.

# *The War of Independence*

## *Birth of the American Nation*

THE SEVEN YEARS WAR which was waged from 1756 to 1763 between Britain, Prussia and Hanover on the one hand, and France, Austria, Russia, Saxony, Sweden and finally Spain on the other, had two main aspects. In one it was a duel between Britain and France for the overseas empire in America and India; in the other it was the struggle of Prussia against enemies encircling her. Though it ended with Canada safely in English hands, and with France without an effective foothold in India, it also left England with a load of debt.

To meet the debt, still heavier taxation was introduced, the brunt of which was carried by the landowners, already the major taxpayers, and under the increased burden they became restive. Their representatives, who dominated Parliament, firmly believed that relief could be obtained if the colonies were called upon to contribute, and that the American colonies particularly could assist by undertaking at least some of the cost of the army in America.

A considerable revenue was raised in England at this time by the sale of stamps necessary to validate certain business documents, and it was decided to extend this system of taxation to America. On 5 February, 1765, the House of Commons passed the necessary resolutions to make this effective, and immediately two opposing tendencies met in sharp conflict.

In England, George III was the prime mover in designing the policy of organizing and administering the great empire which had recently been increased by the fruits of victory. In America, colonies over a hundred years old, well populated, and with a national spirit and way of life already strongly developed, resented any interference in their domestic affairs. They maintained that they, and not the British Government, should determine what taxes they should pay, the basis on which they argued being what is now one of the major slogans of democratic government: "No taxation without representation." Since they had no voice in affairs at Westminster, Westminster should have no right to tax them.

So great was the pressure exerted by the colonists that before the Act ever came into operation the Ministry which had passed it was driven from power, and in 1767 the Stamp Act was repealed. At the same time that this was done, however, the British Government passed a Declaratory Act which asserted the full authority of the Home Parliament over the colonies.

At home the landlords continued their efforts to obtain relief from taxation.

Now, the colonists' objection to taxation which directly touched their internal affairs could be easily understood. But at the same time that they resisted this form of control, they did admit that Great Britain had the right to control their external trade, and that this control could be exercised by the home government's imposition of duties on goods entering the country.

In their reasonableness, however, they did not seem to realize that they were practically suggesting a new method of making themselves partly responsible for the Englishman's tax burden; and it would have been strange indeed had they not been taken at their word by the responsible minister at Westminster, the Chancellor of the Exchequer.

In 1767, Charles Townshend had recently been appointed Chancellor, and he immediately seized upon this "offer" by the colonists. He introduced Bills into Parliament imposing duties on glass, lead, painters' colours, paper and tea shipped from England to America.

At once the colonists protested that this was going too far, and when Townshend refused to withdraw they declared a boycott of British goods, and unanimously resolved to pay no debts to England until the Acts were repealed. As in the case of the Stamp Act, so this Act brought about the downfall of the Ministry.

The new Ministry, led by Lord North, repealed the Act except that section which covered the duty on tea. For a time there was comparative quiet, and all might have been well had not the East India Company reaped an extraordinarily abundant tea harvest, and decided to dump its surplus stock in America.

In taking this decision, the directors of the East India Company had argued that the colonists could have no objection, because while the home consumer paid a shilling a pound tax, they would only have to pay threepence a pound. But the colonists did object, and with considerable violence.

It was not that the colonists objected to the amount they would have to pay. The true objection lay in the question of whether the home government could justly claim to have a *right* to tax them



at all. And so strongly were the opposing views argued by both sides that tempers flared and a series of unpleasant incidents occurred.

On their part the British imposed unpopular restrictions on colonial trade. In retaliation, a Boston mob, in 1770, attacked British soldiers in the street and the soldiers fired on them, with fatal results. Two years later, the citizens of Providence, on Rhode Island, set fire to a small British warship which had run aground there, and had caused resentment by her efforts to stop illegal trade. In the following year, a party disguised as Red Indians threw into Boston harbour 340 chests of tea about to be unloaded from British ships.

But this was not the only source of trouble for the British on the American continent. In 1774 the British Parliament passed the Quebec Act, which offended colonial religious susceptibilities by its liberal attitude towards the Roman Catholic Church in Canada, and it also placed the vast hinterland north of the Ohio as far as the Mississippi under the rule of a despotic governor in Quebec. The colonists argued that the Bill threatened the liberty and expansion of the colonies. The popular reaction in Canada was as strong as that of their American neighbours *vis-a-vis* taxation.

The climax came when following upon the incidents at Boston, the British closed the port until the city agreed to make amends. General Gage was appointed Governor of Massachusetts and was provided with a large military force.

It was now evident that war was near. With Massachusetts and Virginia leading the Continental Congress, gathered at Philadelphia in the autumn of 1774 for the purpose of uniting the colonies in action, Gage saw that Massachusetts was preparing to fight, and on 19 April, 1775, he sent a force from Boston to Concord to destroy the military stores collected there lest they should be seized by the colonists.

At Lexington the column was attacked by armed farmers. It succeeded, however, in completing its mission, but had to withdraw under galling colonist fire. Gage now found himself besieged in Boston.

In May the Continental Congress met again, and made the cause of Massachusetts its own. On 15 June it appointed Colonel George Washington of Virginia to the command of the colonial troops.

While he was on his way to Boston to take up his command, Washington received news of the battle of Bunker Hill, one of two elevations overlooking Boston, which Gage wished to secure. On 16 April, a party of American militia about 1,200 strong forestalled his intention, and though they mistook the nearby hill, Breed's, for

Bunker Hill, the ensuing engagement has always been known under the latter name.

The Americans hastily fortified Breed's Hill, and behind their works they were able to ignore the fire from the British warships in the harbour. Gage thereupon ordered 2,000 infantry to seize the hill. They had almost reached the top when the Americans opened fire and almost decimated them. They re-formed, but their second assault was equally unsuccessful. A third attack was more skilfully conducted, and as by this time the Americans had run out of ammunition they retreated. The English lost 226 killed and 828 wounded and missing, while the colonists' losses were about 450 killed and wounded.

Washington now planned an aggressive war. To make the Union continental, he considered it necessary to occupy Canada. Already in May, 1775, the Vermont leader, Ethan Allen, had seized Fort Ticonderoga, commanding the route by Lake Champlain to Montreal, and by the late autumn the Americans held the St Lawrence with the British garrison shut up in Quebec. But the sea-route to Quebec remained open, and the arrival of a relieving fleet in the spring of 1776 led to the entire withdrawal of the American forces from Canada.

In March, 1776, the British abandoned Boston and moved to Halifax. Gage was replaced by Sir William Howe, who had a plan for attacking New York and Philadelphia, and cutting off the North from the South, which he would then subdue in turn. By mid-September Howe was in New York, but the adoption by Congress of the Declaration of Independence on 4 July, 1776, made any thought of surrender impossible. Congress now sought to make an alliance with France.

Meanwhile, the British were gathering an army in Canada under General Burgoyne, and in the summer of 1777 Burgoyne invaded New York State by way of Lake Champlain. Had Howe advanced up the Hudson from New York to join up with Burgoyne, New England could have been cut off from the other colonies. But the generals had not been instructed to co-operate and so a great opportunity was lost.

While Burgoyne was invading New York State, Howe launched an attack on Philadelphia, and on 26 September he defeated Washington at the battle of Brandywine, and occupied the city. But already a crisis was developing for the British, and soon disaster was to overtake Burgoyne. On 17 October, with six thousand men, he surrendered to General Gates at Saratoga, a victory for the

Americans which persuaded France to sign an alliance with the colonists.

Despite this, however, the cause of the colonists was in a very precarious situation. Driven from Philadelphia, the Congress had no effective organization with which to prosecute the war. Only the incompetence of the British commanders and a badly conceived plan of campaign prevented a final British victory at this stage.

On the entry of France into the war, the British decided to abandon an extensive campaign, and, concentrating on New York, to use their sea-power in coast raids with the hope of wearing out the colonists. Accordingly, in June, 1778, Howe evacuated Philadelphia and returned to New York.

But this enabled Washington to set up his chief post on the Hudson, and from there he was able to check any British advance to the interior.

A long period of inactivity followed and the spirit of the Americans declined. Howe was replaced by Sir Harry Clinton, who arranged with the treacherous American general Benedict Arnold the handing over of West Point, the chief American supply depot, to the British. The plot was discovered in time, but it demonstrated how hopeless at least one leader believed the colonists' cause to be.

The British now turned their main effort to the South, where they met with considerable success. By August, 1780, the whole of the South to the Virginian border was in British hands.

This success was due almost entirely to Lord Cornwallis, who was the first really able British general to appear on the scene. His aggressive policy appeared to be justified. He met Greene, Washington's ablest general, at Guilford Court House, North Carolina, on 15 March, 1781. The battle was drawn, but Cornwallis, relying on reinforcements which were to be brought to him by sea, pushed on into Virginia. To master Virginia was to master the whole South; to fail here was to fail elsewhere.

He overran the greater part of the state, but Greene slipped past him, and now embarked upon a victorious campaign. By September, after severe fighting, he had recovered most of the South and Cornwallis was confined to the area between the York and James rivers.

The weakness of Cornwallis's position was not lost on Washington. The British support from the sea was insecure, for Holland and Spain had now entered the war, and with France threatening the British in the West Indies the fleet was divided.

Cornwallis made his headquarters at Yorktown, an exposed

position near the mouth of the York river. A French fleet cut off rescue by sea, and Washington closed in from land. This masterly combination meant surrender or annihilation. On 19 October, 1781, Cornwallis surrendered with an army of 7,000 men. The disaster ended the war.

Peace negotiations were put in hand immediately, and in November, 1782, a provisional treaty was signed in Paris. Washington then declared hostilities at an end. On 3 September, 1783, the final treaty was signed, and the British evacuated New York, their last stronghold.

The treaty recognized the independence of the thirteen states, and to the United States, which they formed, was given the sovereignty of the vast region between the Alleghany Mountains and the Mississippi.

The American War of Independence influenced profoundly the whole western world. Though the loose union of the thirteen states broke down on account of corruption and inefficiency, it yet led to a new federal constitution in 1787, under which the present United States is governed.

By lack of foresight, by incompetence and by the failure to appreciate the spirit of men sprung from their own stock, the British lost their richest possession. With more understanding, the United States might to-day still have been a member of the British Commonwealth.

## *The Manifesto of Miss Wollstonecraft*

### *An English Governess Starts the Movement for Women's Rights*

WE LIVE in an age of revolutions, political, social, economic and technological. But there are good grounds for claiming that the most important revolution of all that the present age has seen lies in the sphere of sexual attitudes and relations. For the first time in history, in all the more civilized countries of the globe, the female sex has achieved a position of practical equality with the male.

Very largely this astonishing transformation has taken place in quite recent times, since about the time of the First World War; but it was prepared for and led up to through many years, generations even, of effort and sacrifice on the part of unnumbered people, both men and women. If there is one person who may be said to have started it all, it was a woman who lived in England in the latter part of the eighteenth century. Her name was Mary Wollstonecraft, and it is not remembered so often or so gratefully as she deserved that it should be.

Not that she herself would have been surprised at that. She was used to dislike and reprobation and downright hostility, and she had unkind things said about her than that she was a "hyena in petticoats" and a "philosophizing serpent". After all, she had written a book, which was something which in those days it was considered not altogether proper for a lady to do. Worse still, she had called it *A Vindication of the Rights of Woman*.

"Rights of women!" snorted Mrs Hannah More, one of her female critics; "we will be hearing of the rights of children next!"

Mary Wollstonecraft herself had not much experience of women's rights, but much more than her share of woman's wrongs. Like all the women of her time, and for long before her time and a good while after it, she had been taught that a woman's place was in the home, as dutiful daughter, submissive and affectionate wife, and devoted parent. That was the theory, but it hadn't worked out like that with her. She thought of the home into which she had been born (it was in 1759, in one of the villages that then dotted the

north-eastern fringe of London), a place in which the dominant personality was the father, who had wasted his patrimony in drink and wild living and made the lives of his wife and family a frequent hell. Many a time, while she was still a child, she had thrown herself between husband and wife in their violent wrangling, and had stood guard over the bedroom door in which her younger brothers and sisters were sleeping.

She had been assured that education was not necessary for a girl: she would marry in due course, and husbands in general did not like their spouses to know too much. Books put ideas into girls' heads, ideas which they were much better without. Somehow, she had managed to get some sort of education, however; and well it was that she had done so, for the family came to depend on her poor earnings for their subsistence. The brothers who ought to have helped her sponged on her instead, and when her sister married it was to an unfeeling brute who drove her to the verge of insanity, and it was Mary who had to rescue her from the madhouse. When her best friend married, that, too, turned out to be but a poor advertisement for the married state.

At the age of nineteen she went out into the world to earn her livelihood, with no training and no influential friends to help her. She became a lady's companion, and then a governess, and after that teacher in a school that she started herself. For nine years she kept herself, and her family, afloat in this way. Her last experience in the governing line was in the employ of an Irish lady of title, and ended in her being given her notice by her ladyship, who with a jealous clearsightedness had noticed that her children were fonder of their governess than they were of her. She had always wanted to write, and already she had had a small book published; it was entitled *Thoughts on the Education of Daughters*, and the publisher, Mr Johnson (no relation of the famous Doctor), had paid her ten guineas for it. On the strength of this small success she went to London, where Johnson found some literary work for her to do, not least as a translator, for somehow she had managed to teach herself French.

For the first time in her life she was her own mistress, and she revelled, in her typically quiet way, in her new-found freedom. She rented a room in a back street in the Blackfriars quarter, where she toiled at her books and articles, all through each day and often far into the night. Probably it was because her room was generally in such a mess that she discouraged callers, but among those who ventured to knock at her door was Talleyrand, the French envoy, who had been sent to London with a view to persuading the British

Government not to declare war on the newly established Republic.

He was much taken with the literary lady, handsome rather than pretty and now arrived at the interesting age of thirty, notwithstanding her untidy hair and ink-stained fingers. He found her intelligent, decidedly so, and an excellent talker, once her armour of shy reserve had been pierced. He remembered that they drank wine together—out of tea-cups since she had no glasses in her cupboard.

For some time past she had been working on a book dealing with the position of women in the world, and very likely they discussed it together. When it was published, in 1792, it bore a dedication to Talleyrand, who by now had returned to Paris and was busily engaged in drawing up a new constitution for the French people. "I dedicate this volume to you," she wrote, "to induce you to reconsider the subject, and maturely weigh what I have advanced respecting the rights of woman and national education; and I call with the firm tone of humanity, for my arguments, Sir, are dictated by a disinterested spirit—I plead for my sex, not for myself . . ."

Talleyrand had written in the most eloquent fashion about the iniquity of excluding "one half of the human race from all participation in government", but the half he had in view were exclusively male, just as the framers of the American Constitution when they asserted that all men are created equal, wrote "men" and meant "men". So far as their vision and provisions went, "man" did not embrace "woman".

No-one, with the exception of such cranks as Thomas Paine and the French philosopher Condorcet, thought there was anything in the least strange about this. From the first woman's mistake in the Garden of Eden, the female sex had been held in subjection, and for ages the situation had been accepted as part of the natural order of things. But Mary Wollstonecraft raised her hand—or should we say, lifted her pen—against the age-old conception. "Consider," she addressed Talleyrand, "I address you as a legislator—whether, when men contend for their freedom, and to be allowed to judge for themselves respecting their own happiness, it be not inconsistent and unjust to subjugate women, even though you firmly believe that you are acting in the manner best calculated to promote their happiness? Who made man the exclusive judge, if woman partake with him of the gift of reason?"

Then she reminded him—and the stroke was a shrewd one—that all tyrants want to crush reason, from the weak king (such as Louis XVI) to the weak father of a family. She was willing to grant that by enlarging the female mind there would be an end to female

obedience. But, "as blind obedience is ever sought for by power, tyrants and sensualists are in the right when they endeavour to keep women in the dark, because the former only want slaves, and the latter a plaything". Talleyrand and his associates in the revolutionary régime had swept away the Divine Right of Kings; surely it was time that the divine right of husbands, "who are often only overgrown children", should follow it on to the rubbish heap.

Unlike some of the women who have had a part in the feminist movement, there was nothing in the least anti-male in Mary Wollstonecraft's contention. True, she often found men to be tiresome creatures. She deeply resented the trivial attentions that men think it manly to pay to "the sex". What can be more insulting, disgusting rather, than the "impudent dross of gallantry" that makes men stare at every female they meet? She thought it ludicrous "when I see a man start with eager and serious solicitude to lift a handkerchief or shut a door, when the *lady* could have done it herself, had she only moved a pace or two". She had the harshest condemnation for those gentlemen, so-called, who boast of their "conquests". What have they to boast about, she very pertinently asks?

She thought that something more than the sexual tie should unite husband and wife, urging that when men become more virtuous "they will wish to converse at their fireside with a friend after they cease to play with a mistress". She protested against the generally accepted notion that woman was created to gratify man's appetite, or to be a kind of upper-servant who provides her husband's meals and looks after his linen. But she saw nothing reprehensible in the mutual attraction of the sexes, nothing essentially low or degrading in the sexual relationship. It is natural for men to love, she agreed, but it was just as natural for women, since they, too, are human beings, with natural desires and inclinations and appetites which it was no shame to possess or to seek to gratify.

"I love man as my fellow," she wrote, "but his sceptre, real or usurped, extends not to me, unless the reason of an individual demands my homage; and even then the submission is to reason, and not to man." What she wanted above everything was for woman to be treated as a rational creature, with her own individuality, which she was well within her rights to seek to develop to its fullest potential of flowering.

There were so few jobs open to women, she complained—little beyond becoming milliners and mantua-makers, and of course governesses. They should be allowed to study the art of healing and



become physicians as well as nurses and midwives. They might follow certain lines of business, so that they could earn their own subsistence and not be driven to marry for support and a home, or be driven into prostitution. How many women wasted away their lives, who might have practised as doctors, run a farm, managed a small shop, and stood erect in the face of the world, supported by their own industry! "It is a melancholy truth," she reflected, "yet such is the blessed effect of civilization, the most respectable women are the most oppressed." Such women were pitied, of course, but (she remarked sardonically) "I have seldom seen much compassion excited by the helplessness of females, unless they were fair. . . ."

Emboldened by her theme, she suggested that, however ludicrous it might sound, women ought to have some share in the government of the country. But above all, they ought to be educated. At a time when the great majority of the British youth, boys and girls, were left in ignorance, she drew up plans for the establishment in every parish of a day school in which the children of all classes of the community, rich and poor, high born and lowly, boys and girls alike, should be given instruction not only in reading and writing but in the elements of botany, astronomy, mechanics, natural history, and what she called natural philosophy and we know as science. "What, boys and girls together? I hear some readers ask. Yes." What was there to be afraid of? What if the young people did form some early attachment? They might make early marriages, but this was something that should be welcomed, not deplored and prevented.

So the *Vindication* runs its course, page after page of excited and often muddled prose. As books go, it is not a good one; she let her pen run away too fast, but even so it could not move fast enough to keep up with the rushing stream of her thought. From beginning to last, it is a moving cry of revolt, against a male-dominated society, a purely male-governed world. If only men would snap women's chains! If only they would be content with rational fellowship in place of slavish obedience! "They would find us then more observant daughters, more affectionate sisters, more faithful wives, more reasonable mothers—in a word, better citizens. We should then love them with true affection, because we should learn to respect ourselves."

Was she wrong? Not surely in the appreciation of the problem and its solution, but in her time-table. She thought that the emancipation of her sex was only just round the corner, but in fact it required a hundred years and more to demonstrate the unanswerable

force of her "vindication". Eventually her ideas bore fruit in what we know as the Women's Movement, but this was long after she was dead.

She had pointed the way along the road, but for her the road was a hard one still. Fewer than half a dozen years were left to her after her book was published, and in large part they were filled with sorrow and disappointment. She went to Paris to see the Revolution at close quarters, and soon found that it was nothing like so glorious as she might have expected. She had a passionate affair there with an American businessman; she loved him deeply, but he left her after their child was born, and twice she attempted suicide. The second time was on a stormy November evening in 1795, when she was dragged out of the Thames into which she had plunged from Putney Bridge.

She steeled herself to keep living, and it is good to know that in her last days she met a man, dull but good, who appreciated her worth and did his best to make her happy. When a child was on the way the unconventional pair, Mary Wollstonecraft and William Godwin, were married, and they set up house together in Somers Town, then a country village. The child who was born to them became the Mary Shelley of the poet's rhapsodies, but the mother died in giving her birth. So in the end an unkind fate had the final word.

Then for a generation, two generations even, little or nothing was heard of the rights of women, although great changes were brought about in their economic position. Tens of thousands of women went out to work in the factories that were clamouring for ever more labour, and the cheaper the better. At the same time the growth of the business and manufacturing community had also resulted in a large increase in the number of unoccupied "ladies", who were often at a loose end, as the saying goes, for something to do. It was these "drawing-room rebels" who launched the women's movement in the middle years of the last century. Step by step, the legal and political disabilities of women were lessened or removed, and the field of their employment was vastly enlarged.

When Mary Wollstonecraft died in 1797 the possibility of such a transformation was hardly dreamed of, and there were few even among women who thought it worth while to dream about. Her book seemed to have been forgotten, and her memory grew faint. But all the same, it was she who "started it all". She found Woman in prison, and she showed how to break the bars and set her free.

## *The French Revolution*

### *The Roots of European Liberalism and Nationalism*

THE EIGHTEENTH century in Europe had its dynastic wars, witnessed a great colonial struggle throughout the rest of the world between France and Britain and the birth of the United States of America. To the majority of Europe's inhabitants whose homes were not on the routes of armies, life had been peaceful and, to those with fortunes or talents above the average and who accepted society as it was, it had probably been a great deal more pleasant than any other period of history, and certainly more secure.

Yet the last decade of this century was to see all Europe in ferment, wars raging continually across the Continent, men in their hundreds and thousands conscripted or press-ganged into armies or navies which fought each other with a savagery and courage never before seen. Men, even ordinary men, at the end of what is called the Age of Reason, were haunted by spirits and visions of human liberty and fraternity, of conquest, of will to resist oppression and of despair. Not even the great Goethe with his love of poetry and science, and his secure position as minister and favourite of a German princeling, could live untroubled by these spectres. The cause of this was the French Revolution which began in 1789.

One of the underlying causes of the French Revolution was that men rejected the Absolute Monarchy inaugurated by Louis XIV in 1660. In its time it had not served France badly and towards the end of the eighteenth century she was a rich country with a flourishing foreign trade and Empire, with the most skilled artisan class in the world, and a productive agriculture. But government by an Absolute Monarch was clearly an anachronism; the sacredness of royal and episcopal authority had been destroyed by the writings of Voltaire and Rousseau and of the French *Encyclopédistes*. Intellectuals looked to England with its constitution and freedom which allowed a sect such as the Quakers to flourish and permitted men to speak openly against war.

Underlying the political questions were more fundamental ones. The middle-classes could no longer bear the insolence of the nobles

who looked down on them, again a difference between France and England which was acutely felt, and they detested the fiscal privileges of the Church. High posts in the Army and the Church were denied to the middle classes. The peasants were hungry for land and furious at the survival of feudal rights. There were other grievances obscurely but powerfully felt. When the Revolution got under way it became far more than a political struggle.

The actual cause of the outbreak of the Revolution was over quite a humdrum matter—how was the King of France to ensure that he had enough money to govern the country and maintain his court.

Owing to a succession of financial crises, King Louis XVI decided in 1788 to summon a kind of national Parliament called the Estates General, a body which had not met since 1614 and which formed no part of the system of Absolute Monarchy. But this step was unlikely to prove successful, for the Estates General represented precisely those parts of French society which held themselves to be immune from taxation or, if not immune, highly privileged. Had the nobles and the clergy who formed two of the Estates General allowed themselves to be taxed, and had the magistrates of the local parliaments, the squires and small landowners who formed the Third Estate, not held so fiercely to the privileges, fiscal and other of the regions they belonged to, there would have been no financial crisis in spite of the cost of past wars and of the extravagance of the Court.

When the Estates General met in 1789 there was an immediate refusal of consent to a system of national taxation. The Third Estate was as adamant as were the nobles and clergy. A majority of the members of the Third Estate, and some of the nobles and clergy felt in their bones that what was under discussion was how to give France a new, more representative constitution with the monarch subordinated to a real national parliament. They were in fact aware of the wind of change which had been blowing through France for the past fifty years. So when the proceedings seemed likely to amount to nothing but wrangles between the three Estates and the Royal Ministers, the Third Estate suddenly declared itself to be a National Assembly.

At a meeting which took place in the tennis court at Versailles on 20 June, 1789, most of the Third Estate and some nobles and clergy took an oath never to separate until they had given France a constitution. King Louis XVI had most of the private virtues; he was well intentioned, at times liberal minded. But he was a

weak vacillating character. After the oath in the tennis court, he listened to his Court and to his Austrian-born Queen, Marie Antoinette, and brought two regiments into Versailles.

It was then that there occurred the event which started the French Revolution, the date of which marks to-day the National Day of the French Republic. On 14 July, a Paris mob, stirred up by the oath of the tennis court and the king's counter-move, stormed the royal fortress of the Bastille and massacred the garrison which had surrendered on safe conduct. When, in his Palace at Versailles, the king heard the news, he turned to the Duke of Liancourt and said: "This looks like a very serious revolt." "No, Sir," answered the Duke, "it is a Revolution."

Indeed in three and a half years from that date, the king and Marie-Antoinette and several members of his family were to be guillotined. For more than two years, France, particularly Paris, was to undergo the régime known as the Terror, and revolutionary France was to be at war with all dynastic Europe.

The taking of the Bastille could have been an event in itself of insignificant importance (there had been plenty of riots during the hundred and thirty years of the Absolute Monarchy), but in fact this mob action revealed the second layer, as it were, of the movement for change which had been long gaining strength. The reformers, the writers and intellectuals whose works amused and were admired by the Court, were the first wave which overwhelmed the intellectual defences of the monarchy and of the bishops; underneath was a revolutionary passion for change, the leaders of which were comparatively unknown middle-class lawyers, merchants or even soldiers, tired of being ridiculed and kept in their places by the nobles, who were determined to end a régime of arbitrary imprisonment as well as arbitrary taxation. And the overwhelming majority of the nation followed their leaders, determined no longer to be subjects of the King of France, but citizens of France.

During the night of 14 July the proletariat of Paris, women and children among them, with all the criminals and desperadoes who were the *hommes de main* of the extreme revolutionaries, the Jacobins, danced in the light of torches round the severed heads of three nobles stuck up on spikes.

During the rest of 1789 and 1790 there was growing anarchy and disorder. The king, and the self-constituted National Assembly of the tennis court, were moved from Versailles to Paris. In an extraordinary session of the Assembly, representatives of the nobility

voluntarily surrendered all their feudal rights over their peasantry, rights which were in fact not often exercised such as that of the disposal of young girls in marriage and the often-quoted obligation of peasants to beat the ponds near the Chateaux to stop the croaking of frogs.

But this did not stop the Revolution; in the country peasants seized the lands of the nobles, particularly if the absentee nobility lived at the Court. Nobles whose houses had been set on fire started to emigrate and one of the first was the king's brother, the Count of Artois, destined to return to Paris in 1814 as King Louis XVIII. For a while Mirabeau, a moderate reformer, attempted to save the monarchy and had it not been for the folly of some Royalists who wanted to wreck any constitution it might have been possible to have persuaded the National Assembly, the most sensible and moderate France was to have for a long time, to have created a constitution which would have retained the monarchy shorn of its absolute power and a government which would have restored order. But Mirabeau died suddenly.

In September, 1791, the National Assembly finished drawing up the constitution, dissolved itself and, unwisely, decreed that none of its members, now experienced in parliamentary affairs, should sit in the new parliament. The constitution was in many respects reasonable. It abolished all the hated feudal exactions and it legalized the taking over of land by the peasants. There was a place for a constitutional king wearing the red, white and blue cockade who would serve the cause of liberty, equality and fraternity. The land and wealth of the Church was confiscated and the clergy high and low were to be State servants. This was not altogether unacceptable, for the Church in France had long depended on the French monarchy.

What provoked strong anti-revolutionary feelings among Catholics, particularly in the west of France, was that priests were henceforward to be elected by laymen who might well be atheists. An impracticable aspect of the new constitution was that the power of the government elected by the Assembly was to be severely checked on all sides, whilst the municipalities directly elected by the people were to have the right to decide what taxes should be levied in their areas and to exercise control over the National Guard.

Before the Constitution appeared and the Assembly was dissolved, the king had committed among many errors a fatal one. At Easter, 1791, he and the queen had been prevented by a mob from taking

communion in a private chapel at St Cloud. As a result of this experience he and his family made a badly organized attempt in June to escape from France in a private coach and were captured by the National Guard at Varennes and taken back to the Tuileries under escort.

A year later, after many indignities and just before the election for the new Assembly, the Jacobin Commissar Danton ordered the attack on the Tuileries at which the king's Swiss Guards were killed almost to a man and the king and his family taken as prisoners to Le Temple. And it was Danton who, a few days later, arranged for the slaughter of all the Royalists in Paris prisons, a measure by which he forced the majority of Paris citizens who were inclined to avoid trouble to realize that too much blood had been shed by the Revolution for any opposition to it to be anything but bloody.

It was from Le Temple on 21 January, 1793, that the king and his family went to their public executions. At the execution of Charles I in 1649, a groan went up from the crowd when the king's head was severed. Cheers greeted the executioners when they held up the gory head of the *ci-devant* Louis to the dancing and singing crowds.

The new government was known as that of the Girondins from the fact that some of its leaders came from the Bordeaux region. Although the émigré nobles clustering on the French frontiers of the north clamoured for a war of revenge, neither the Emperor of Austria nor the King of Prussia were anxious to fight. Both, after 1791, threatened France with combined action if Louis XVI was ill-treated; but both were far more actuated by a feeling of satisfaction that a strong France no longer existed to have its say in German policy and to threaten the Austrian hold of Flanders; both too had their eyes on Poland, which was about to be invaded by the Empress Catherine of Russia and be finally partitioned between the three central powers.

The Girondin government, however, forced war by demanding that the Elector of Trèves should at once dismiss the French émigrés gathered at Coblenz. Although France was disorganized, the Girondins were confident of success and believed that the peoples of Europe would rise to help the revolutionary cause. They even believed for a while that in the struggle against the autocracies England, the country whose constitution they admired, would be with them.

In spite of a rising in Belgium against the Austrians as soon as the French armies arrived, the war went badly and the French were

swept out of Belgium and, a little later, a Prussian army under the Duke of Brunswick invaded France from the east. But at Valmy his army suddenly lost heart and retreated. At Jemmappes in Belgium the French general Dumoriez won a resounding victory. All this together with the seizure of Savoy and Nice by the French armies took place in the autumn of 1792—when the king was imprisoned.

Determined to secure Austrian Belgium, the French armies then proclaimed, in spite of an international treaty, that the Scheldt was open to navigation and incited the people of Holland to form a republic. It was this step which was to lead Britain into the coalition against France, for the elimination of Antwerp as a rival to London and keeping the Low Countries out of the grasp of France was a cardinal maxim of British foreign policy.

By the spring of 1793, after the execution of the king, the military victories of the Republic were shown to be flimsy. William Pitt the Elder had been reluctant to bring Britain into the war for, although Burke and some Tories were the enemies of the Revolution from the beginning, British opinion was divided. Pitt would like to have had his hands free to save Poland from partition. But the threat of Antwerp, combined with the murder of the king, brought Britain into a war with France which was, with a few years of truce, to last until 1815. Spain and Holland joined the side of the Republic's enemies; Royalist revolts broke out in the Catholic Vendée of Brittany and in the region of Lyons; the British fleet seized Toulon; France's best general, Dumoriez, disgusted with the growing Terror in Paris, went over to the King of Prussia.

But the tide turned again and the summer of 1793 began a memorable year for the Republic. The Austrians were soundly defeated at Wattignies and Fleures; Holland was invaded and a handful of French cavalry galloped to Texel and compelled the Dutch fleet to surrender; all internal revolts were put down and Toulon recaptured from the British: not a foreign soldier remained on French soil and a friendly republic was created in the Low Countries.

Three things partly explain this miracle: first the pre-occupation of Austria and Prussia with Poland; secondly the sympathy of the peoples of the Low Countries with the Revolution; and thirdly the fact that the French army was not as disorganized as it was supposed to be and, in any case, enough professional soldiers remained to act as a trained nucleus for the hordes of enthusiastic recruits who poured into it as part of the *levée en masse*.



The first national army in fact was called into being by Robespierre, the Jacobin leader, who had taken over power from the Girondins and before these enthusiastic soldiers, the well-drilled but tepid-spirited soldiers of the dynasties proved inferior. Unlike the eighteenth-century armies, these citizen armies lived off the countries which they had once liberated and looted. They were highly mobile, their baggage trains were reduced to a minimum. The use of artillery was perfected. The military semaphore was first used so that Paris learnt of the victory at Fleures long before Vienna learned of the defeat.

It was during this memorable year of victory that the Terror was at its height in Paris. Robespierre, the prim, virtuous fanatical lawyer from Arras, was a believer in totalitarian government. Girondins along with Royalists were ruthlessly butchered, and soon his great rival Danton who had advocated a return to clemency in the hour of victory passed under the guillotine. Robespierre was a believer not only in the great and pure republic but in the Supreme Deity, and soon members of the Convention, as the Assembly was now called, were executed for atheism or for anarchic opinions.

In July, 1794, Robespierre and the Paris Commune were overthrown by the more moderate revolutionaries and, with his jaw fractured by a bullet and covered in blood, Robespierre was dragged on to the scaffold in his turn. The era of guillotine and the Terror was over. The number of its victims was estimated to have been some three thousand in Paris and perhaps twice that number for the rest of France.

The moderate revolutionaries, Dantonists and Girondins, who now ruled Paris had still to fear internal enemies in the capital—the Reds of the Paris Commune, the supporters of Robespierre and the well-to-do classes who had supplied the forces necessary to overthrow Robespierre. A democratic constitution was still impossible and in 1795 the Convention—the National Assembly charged with revising the constitution set up in 1792, which sat as a sort of permanently revolutionary body—was twice attacked from the Left.

The Directory of five men, the most able of whom was Barras, was now to govern, in the name of the Revolution, for four years with a façade of democracy in the shape of a Parliament with two chambers elected on a limited franchise, membership of which was restricted to members of the old Convention who had voted for the execution of the king in 1793. In October, 1795, cries of *Vive le Roi* were heard in the streets of Paris, and if it was true that only

one man in a hundred and thirty had actively backed the Terror, it was possible that the passive minority were now capable of overthrowing the Revolution.

Twenty-six thousand men in Paris were said to be preparing to attack the regicides of the Directory. It was then that Barras decided to entrust the defence of the régime in Paris to a young artillery general, Napoleon Bonaparte, who had distinguished himself at the siege of Toulon. Napoleon sent one of his then unknown lieutenants, Murat, post-haste to bring cannon into the city. On 3 October a prompt and savage cannonade—"the whiff of grape-shot"—dispersed the expected riots. The young general was given command of the army in Italy.

The Revolution did not give France a democratic Republic, and after the fall of Napoleon the Bourbons returned to rule France for fifteen years and the liberal monarchy of Louis-Philippe was to last until 1848. And even then the second French Republic was to last barely three years and to give way to the Second Empire of Napoleon III. What the revolutionary period and the Empire did was to make the French people conscious of being a nation.

If in terms of creating a democratic political organization the Revolution failed, it nonetheless ensured that France was to become a country which stood for political liberty and human rights. It gave the French people the notion that three great universal principles, liberty, equality and fraternity, were specifically French. So just as Joan of Arc gave the French monarchy and France the feeling that France had a divine mission, that to fight against France was to fight against God, so the Revolution enabled the French to believe that France was the source of human enlightenment and the enemies of France were inevitably the agents of reaction and the enemies of humanity. These two conceptions have co-existed and continue to do so in the soul of the French people.

Because of Napoleon's conquests, the French Revolution became for the rest of the world inextricably mixed up with a new attempt to unify Europe under French hegemony. Yet it had a much more profound effect on men's minds. After the French Revolution there were long to be more or less absolute monarchies in Europe. But the doctrine that man was born a subject, that his main duty was to serve his prince, was nowhere accepted by any large body or intelligent opinion in Europe.

Individual men had the right to the pursuit to happiness. Men were born equals. The French Revolution meant that throughout Europe the idea of a nation—of a group of people who feel they

belong together—triumphed over the conception that groups of people belong, as a result of marriages and conquests of dynasts, to other groups with whom they have no racial or linguistic affinity. European liberalism and nationalism both have thus their roots in the events which began in 1789. So the French Revolution is a great dividing line in world history, and Goethe, who was with the Prussian army at Valmy and saw this army retreat before the revolutionary forces of France, was right to say to a group of officers: "From this place and from this day begins a new era in the world's history: and you can all say that you were present at its birth."

## Austerlitz

### *Napoleon Dominates Europe*

WHEN THE news reached England of Napoleon's victory over the combined armies of Russia and Austria at Austerlitz on 2 December, 1805, William Pitt, England's great liberal-minded Tory Prime Minister, who was, like Churchill in 1940 against Hitler, the tireless animator of his country in the grim struggle against Napoleon, pointed to a map of Europe on the wall of his room and said: "Roll up that map, we shall not need it these ten years." Pitt, it was said, died of Austerlitz—though in truth he was a sick man and weakened by his exertions.

The victory seemed to show the hopelessness of resisting Napoleon and the French armies of the Revolution. Napoleon, it will be remembered (see "The French Revolution"), had been created General of the Army of Italy by the Directory which had taken power in France after the Terror and the fall of Robespierre. At the age of twenty-eight, he had won a series of brilliant battles against the Austrians in Italy. Already the French Republic feared England the most of all its enemies, and Napoleon when appointed commander-in-chief decided to strike at the British Empire through the Middle East and India.

In 1798 he landed in Egypt. The expedition was a failure largely because the British controlled the Mediterranean, but it nevertheless added to Napoleon's glory. The spectacle of a French general entering Jerusalem and reading the Bible to his officers in Nazareth touched the historical imagination of the French people. Here was a mighty conqueror emulating the exploits of the Crusaders of St Louis. Napoleon once spent a long time gazing at the Sphinx. "What did it mean to you?" he was asked. "It is sad—like all greatness," he replied.

When Napoleon came back to France in 1799 he found that the Russians and Austrians had won back northern Italy. The Directory lacked vigour and was too commonplace a system of government to satisfy the excited French people. Napoleon was made First Consul by a *coup d'état*. He reconquered Italy at once, winning

the great battle of Marengo and once more in Germany and Flanders as well French armies were everywhere victorious.

When, in 1801, Napoleon forced the Emperor of Austria to sign the Treaty of Lunéville, France's frontiers reached the Rhine and France was surrounded by Republics which she had created—the Republics of Lombardy and Liguria, the Helvetic (Switzerland) and the Batavian Republic which embraced Flanders and Holland. The great position of France was not only due to Napoleon's genius but to the effect of the Revolution on the minds of men, and the support France aroused from European progressives.

On 18 May, 1804, Napoleon Bonaparte was crowned Emperor of the French by the Pope in Notre Dame, taking the crown from the Pope's hands and putting it on his own head as Charlemagne had done in A.D. 800. The pompous ceremony took place a little more than eleven years after the last anointed king of France had had his head severed by the guillotine. Six years later, the new emperor was, like the last Bourbon king, to marry a daughter of the Emperor of Austria, a Hapsburg of the oldest ruling house in Europe, and a very similar marriage contract was to be drawn up.

In the course of the next few years, when continental Europe was to lie at his mercy, the Emperor Napoleon was to make his brothers kings, and his marshals were to become princes and dukes. To most of the French people the Napoleonic Empire seemed to grow normally out of the Revolution. Imperial titles did not offend. What the Revolution had been fighting was a system of government by an absolute monarch with a Court and a régime which had given immense privileges to nobles and clergy. Napoleon, his family and his marshals had nothing to do with the old order; he had risen to power and won the admiration of the nation as a servant of the Revolution.

Two months before his Coronation, Napoleon had caused the young Duke of Enghien, a Bourbon prince of the blood-royal, to be kidnapped from Germany on the flimsiest of accusations. The duke was summarily shot. It was convenient from every point of view to show the French people that the emperor was a convinced regicide and as anti-royalist as the majority of the nation. The empire was continuing the Revolution and was giving it order, authority and stability. The creation of the Consulate and then of the empire had been put to popular vote by referendum and approved by enormous majorities.

In 1802 England and France signed the Treaty of Amiens which left France with her continental possessions and her client states

and England with vast overseas conquests, including South Africa taken from the Dutch. At this moment, Napoleon knew that he was capable of vanquishing over and over again the professional armies of the dynasties. England was the only adversary he had to fear and he had been unable to dispute her command of the seas. Admiral Duncan had destroyed in 1797 the Dutch fleet on which Napoleon counted; Nelson in 1798 had blown Napoleon's own fleet out of the water at the battle of the Nile, and put an end to any success of his Middle East expedition; and Nelson again in 1801 had struck at the Danish fleet at anchor before Copenhagen lest it should be used to further French designs.

It is possible that if Napoleon had decided to work for peace in 1802 and to make his dynasty secure, he might have succeeded. But he would have had to sacrifice much to England, including the abandonment of French control over the Low Countries, and he was not the man to make these sacrifices. Perhaps Napoleon lacked the very highest gifts of statesmanship; he underestimated the importance of sea-power and also failed to understand the force of national feeling which sooner or later was to follow on his juggling with European territories.

Napoleon, as much as the British, decided that the Treaty was only an armed truce. In 1804, British subsidies once again succeeded in getting the armies of Austria, Russia and Prussia in action against France. Napoleon had gathered at Boulogne and along the Channel coast an army of two hundred thousand men who for nearly two years were to await the signal that the French navy had temporarily obtained control of the Channel and that they could cross. Admiral Villeneuve at one time gave Nelson and the British blockade the slip and French hopes were high; but by the summer of 1805 Villeneuve had slunk back into Cadiz harbour. The invasion was called off.

Napoleon took command of the armies in Germany. On the day that Napoleon won his first victory at Ulm against the Austrians, Admiral Nelson with twenty-seven ships of the line utterly destroyed the combined French and Spanish fleets at Trafalgar. Britain's sea-power was in fact to prove the doom of Napoleon. But this was not fully perceived in London. Austerlitz outweighed Trafalgar, which had, in any case, witnessed the sad death of Nelson.

The Emperor of Russia, the chivalrous Alexander I, and William Pitt, both had the greatest hope of crushing Napoleon at Austerlitz once and for all. Napoleon's armies after the abandonment of the invasion of England had marched east and had surrounded and captured an Austrian army at Ulm on the Bavarian frontier. This

easy victory had encouraged Napoleon to enter Vienna, in spite of the fact that there was a large Austrian force in the Tyrol on his right flank and another in Bohemia on his left, and the main Russian and Austrian armies, commanded by the two emperors, to the east of Vienna in Moravia, near Olmutz. The army of the two emperors alone was larger than Napoleon's force. Unlike the constantly defeated Austrians, the Russians had defeated the French in Italy in 1798 and were full of confidence.

By advancing towards Olmutz, Napoleon seemed to be falling into a trap. The two emperors, whose army was drawn up on some hills of which Austerlitz was the centre, had only to wait for the other Austrian armies or even perhaps the Prussians to march to join them whilst Napoleon, liable to be harassed by a hostile population at the slightest reverse, waited in front of them or tried to attack a strong position held by stronger forces than his own. Napoleon advanced across the plain in front of Austerlitz and then appeared to hesitate. He sent envoys to the Czar on a mission of courtesy. As he had hoped, this mission was returned and the Russian visitors noticed that Napoleon was about to retreat and that there were signs of great confusion in the camp.

On the day following the Russian visit, 1 December, Napoleon exclaimed rapturously, "That army is mine." The Russian general Kutosoff, a wise if somewhat somnolent general, did not want to attack Napoleon until the Austrian reinforcements had arrived. He was over-ruled, however, by the Austrian generals and the young Russian entourage of the Emperor Alexander. A large part of the Russian and Austrian troops now began to leave the hill-tops and reinforce the left wing of the allied army and to march on to the flat land. They were, in other words, going to give battle on the plain.

Never had the morale of the French been at a higher point. The long tradition of victories was reinforced by the recent Austrian debacle at Ulm and by the pleasures of the occupation of Vienna. Napoleon inspired absolute confidence. He was still only thirty-six and at the height of his powers. When he went round the battle-lines that night, an old grenadier said to him: "Only promise us that you will keep yourself out of the line of fire." "I shall be with the reserve", answered Napoleon, "until you need us."

December 2nd began with fog and mist, to the delight of the Austrians and Russians who thought they would complete their manoeuvre without the French seeing what they were doing. But suddenly the sun with uncommon brightness came through the

mist, the sun of Austerlitz. It was in this blazing sun that Napoleon at once sent a huge cavalry force under Marshal Soult into the gap left between the centre and the left of the Austro-Russian battle-front. This charge completely severed the enemy's centre from his left. It was then that Napoleon attacked the enemy's centre above which, on the highest point of the hill, the two emperors were watching the battle.

After a violent struggle which lasted for a couple of hours the French drove the Austrian troops away to the Austro-Russian right whilst the two emperors left the field. The French had also begun to attack the right, but now with French artillery halfway up the hills and firing down on the Russo-Austrian squares the issue was never in doubt.

There was suddenly a general panic flight, the Russians and Austrians fleeing across a number of small frozen lakes. French cannon-balls broke the ice, and in this last part of the battle it is said some twenty thousand men perished from cannon fire and drowning. The two emperors were now in flight with some fragments of their army. Some twenty thousand prisoners were taken in this great battle together with fifty cannon and all the standards of the Imperial Russian Guard.

Austerlitz did not mark the height of Napoleon's glory. He was to go on winning battles. The next year he won a crushing victory over the Prussians at Jena and defeated the Austrians at Friedland in 1807. But Austerlitz went to Napoleon's head. He imposed a crushing peace on Austria as on Prussia, thereby showing that he was determined no longer to conciliate Europe but to dominate it. Austria lost all her territory in Germany and Italy; it was to be the end of the Holy Roman Empire. From Venice which he annexed, and from Naples where he installed his brother Joseph as king, Napoleon now plotted to attack Constantinople and once more, with Europe in his hands, strike at England through the east. Napoleon, the brilliant soldier and politician, had now become the all-powerful emperor aspiring to world domination—which he would share with Alexander. For the Czar admired Napoleon's genius, and at Tilsit in 1807 the two emperors swore eternal friendship and alliance. Britain's answer was to declare war on Russia and to bombard Copenhagen. The British fleet patrolled the coasts, answering the boycott of British trade which Napoleon tried to make all Europe implement by a still more rigorous stoppage of all maritime activity on the part of the continental countries.

After Napoleon's coronation in 1804, and far more markedly



after Austerlitz, the Treaty of Pressburg and Jena, Napoleonic France began to lose that support she had received in Europe from men of all nations who saw in France the custodian of liberty from the tyranny of the past.

Obsessed with the idea of bringing down England by closing the Continent to her, Napoleon embarked, in 1806, the year of his triumph at Jena, on the conquest of Iberia. The Spanish people rose against the invader and at Baylen in 1808, to the surprise of the world, twenty-seven thousand French troops were surprised by Spanish guerrillas and forced to capitulate. Napoleon had to come personally to Spain to restore French prestige, but France's hold on Spain was never sure. Unlike the Germans, the Spanish were not impressed by Napoleon's victories on the Continent; indeed they had scarcely heard of them. What mattered still more was that Portugal and Spain offered a favourable terrain for the British army under the Duke of Wellington to contribute to the downfall of Napoleon.

The success of the British forces and the Spanish guerillas encouraged Austria once more to enter the war and Napoleon was obliged to rush back from Spain. He defeated the Austrians on the Danube in three small but fierce battles and then won the great victory of Wagram. But Napoleon found that the Austrian troops at Wagram were better led and fought much more seriously than in the past. Was this a sign of the times? Why were the Tyrolese daring to revolt? The Dutch refused to submit to orders to boycott British trade and Napoleon had to recall his brother Louis, who had sided with his subjects, and to make Holland into a number of French departments. And then, in 1810, the Czar Alexander, the newly found friend, refused suddenly to close Russian and Scandinavian ports (Scandinavia and Denmark with Russia formed a northern league) and in fact opted out of the Continental blockade of Britain.

Napoleon's decision to invade Russia in 1812 marked the beginning of his downfall. He entered Moscow at the head of the largest army he had ever mustered, an army in which Poles, Germans, Italians and Netherlanders marched with the French veterans. The Czar refused to discuss peace terms even though the capital was captured. In October, the wooden houses of Moscow began to burn and, by the middle of the month, the great retreat began. Even though the Grande Armée was a skeleton and, one by one, the German States deserted his cause; even though Austria re-entered the war, Napoleon managed to fight a brilliant campaign in Germany.

But at Leipzig in 1813 the last great French army was defeated and Napoleon had to retreat to French territory. Never better did he show what a great leader he was than in the defensive campaign in northern France; but by April, 1814, he was forced back to Paris and his marshals and generals advised him to abdicate. The victorious allies exiled him to Elba but gave him sovereignty of the island. It was the Russian Czar who insisted on this comparatively chivalrous treatment of the vanquished emperor.

In Elba Napoleon, who once boasted that he could spend five hundred thousand gold francs a day and had an annual income of a hundred thousand soldiers—what does a million men matter to me, he once asked—was now reduced to living off the receipts of the iron-ore mines of the tiny island, and accepted the jewels of his rich and generous sister Pauline Borghese. He was then forty-five, the same age as the Duke of Wellington.

# Waterloo

## *The Beginning of British Nineteenth-Century Predominance*

IN BRITISH history the Battle of Waterloo, 1815, is a date as well known as 1066. It marked the end of an immense effort by Britain to defeat Napoleon, of a war sustained for twenty-two years, in which Britain alone of the powers of Europe never compromised herself, much less allied herself, as did at times Austria, Russia and Prussia, with the Emperor, and, except for a short armed truce between 1802-1804, never ceased fighting him.

Well might Napoleon say: "All the ills and curses which can afflict mankind come from London." It was British sea-power which attacked him in the Mediterranean and in the Baltic and which had made possible the landing of a British army in Spain. Since he could not invade England he had been forced to try and master all Europe to blockade and starve her out, and so it was really because of England that he had embarked on his disastrous invasion of Russia in 1812.

The Battle of Waterloo itself was one of the most glorious ever won by a British army. It was not on as large a scale as some of the other battles of the Napoleonic wars; but it was one of the most savagely fought and certainly the most decisive.

When the Revolution began, there was more sympathy for it in England than in any other country. At the news of the taking of the Bastille in 1789, Charles James Fox, the great Whig leader and friend of the Prince Regent (afterwards George IV), exclaimed: "How much is this the greatest event that ever happened in the world. And how much the best." William Pitt the Younger, the Prime Minister, who was to be the tireless animator of the war against France, began the war reluctantly. He declared war in 1793 both to prevent Holland, Belgium, particularly the port of Antwerp, from falling into French hands, and because a wave of indignation against the execution of Louis XVI was sweeping the country. Even so, many people in England continued to sympathize with the ideals of the French Revolution and thought that England ought to try and treat with Napoleon even after he had become emperor.

Many of the great Whig leaders, including Fox, took no part in government during the whole course of the war and skulked in their country houses. The government was alarmed at the extent of opposition, and replied by repressive measures including the suspension of the Habeas Corpus Act. Charges of high treason were brought against those who dared speak not only against the foreign but against the internal policies of the government. Measures of social reform were set aside. Napoleon's continental boycott of British goods and shipping hit the country hard, and the Industrial Revolution on which Britain's economic strength was based was pushed on regardless of the conditions under which men, women and children were obliged to work and live.

Yet in spite of the fact that reaction was in power the English genius for politics still kept its strength. Juries composed of men who were probably themselves anti-Jacobin and haters of French ideas, acquitted liberals and revolutionaries against whom the government prosecutor asked for severe sentences. Liberty of opinion, though muzzled, remained. In 1807 the British Parliament abolished the Slave Trade—the work of Wilberforce whom Pitt had supported.

As the war went on, Napoleon's conquests and his threatened invasion of England made the war increasingly a national one. A country which could allow itself to be divided and yet could maintain the essential freedoms whilst fighting for its life was a more dangerous foe to France than the countries in which public opinion did not exist as a force at all. When, in 1814, the Allies entered Paris and Napoleon was exiled to Elba, there was immense elation, the feeling of having escaped from the gravest danger that had threatened Britain since the Spanish Armada.

The Duke of Wellington, British plenipotentiary at the Congress of Vienna, set up to reorganize Europe, counselled moderation in the treatment of France. His advice was listened to respectfully, for thanks to Trafalgar and the Peninsular War Britain's prestige was high. It was to be higher still after the Hundred Days.

On 1 March, 1815, Napoleon Bonaparte sailed from Elba and landed on the south coast of France with eleven hundred men. He knew the Bourbons and the new régime were unpopular and thought that the French army would desert to him. He was right. Marshal Ney, who told King Louis XVIII that he would bring back Napoleon to Paris in an iron cage, went over after Napoleon had captured Lyons, the second city of France. On 19 March the king left Paris in a coach for Ghent, and on 20 March Napoleon was

back, Emperor of the French, in the Tuileries. The Hundred Days began, and perhaps Napoleon had never shown in all his life greater daring than by this enterprise.

When the news of Napoleon's triumphant enterprise reached Vienna, the statesmen of Europe who had been planning the reorganization of the continent acted with surprising agreement. Although Napoleon had sent messages announcing his peaceful intentions, he was at once outlawed by all the powers. Napoleon had expected that his wife, Marie-Louise, would have used her influence with the Emperor of Austria. In France, he had stressed that the last thing he wanted was war and encouraged the view that the Empress would return to France with her son, the King of Rome, and with the blessing of the Austrian Emperor. But Marie-Louise, during the nine months that Napoleon had spent in Elba, had acquired a lover, Count Nicpperg, and looked now on Napoleon and France with aversion.

Apart from relying on a woman, Napoleon had made another error. The Congress of Vienna had agreed without difficulty to the very moderate peace terms imposed on France; it was aware of the unpopularity of the Bourbons and it did not wish to make Louis XVIII's position more difficult than it was. In a few months' time, however, the question of partitioned Poland would have come before the Congress of Vienna, and there would certainly have been violent disagreements. It was at such a moment that Napoleon might have better timed his return.

Napoleon quickly realized that he could not avoid having to fight once more for his throne. Bitterly hurt by Marie-Louise's infidelity (all the more in that it was the subject of jokes) and aware that, for all the bounding enthusiasm of the French army, his people, and particularly the middle classes, were war weary, Napoleon decided he must win a quick victory. In Belgium was a Prussian army under Blücher, and an English force with German and Dutch contingents, commanded by the Duke of Wellington. He determined to strike at once at these and, by so doing, win back Belgium and Holland where, as he rightly guessed, Republican feeling was still strong. Then he could hope to deal with Austria and Russia separately—and perhaps make peace with the former. For a man who three years before, in 1812, had held all Europe in his power, such a plan was far from impossible.

As a matter of fact this was a widely shared view in Europe and, in Brussels, where the Duke of Wellington now established his headquarters, the population, though markedly friendly to the

British soldiers, believed firmly in a French victory. In England, indignation that Napoleon had been allowed to escape and the world to be pushed once again into war was accompanied by determination to see it through. Many Englishmen admired Napoleon and even, once he had been exiled, felt a sort of sympathy for him; but scarcely anyone favoured treating with him.

The determination to fight, however, was not matched by much immediate effective preparations. Troops were shipped slowly over to Belgium and the Prince Regent was tardy about making decisions and interfered with the selection of high officers. By the beginning of June, when Napoleon's preparations for invading Belgium were clear, some of the best regiments of Britain's army were still in the United States, which in 1813 had been persuaded to enter the war as France's ally.

The Duke of Wellington, when the campaign began, commanded an army of some forty-nine thousand men of whom only about twenty-three thousand were British. While some of his German contingents were reliable, the Duke believed, and he proved right, that the Dutch and Belgians were poor and unwilling soldiers. Altogether, he described his force as: "The worst equipped army with the worst staff ever brought together." Wellington, however, loved caustic phrases and never believed in looking at facts optimistically. Perhaps, too, he liked to frighten the world of fashion, a large part of which had flocked to Brussels. Sometimes the Duke was more optimistic. Walking in a park with Mr Creevey, the well-known social gossip, the Duke pointed to an infantryman who was also there and gaping at the statues and said: "There—it all depends on that article whether we do the business or not. Give me enough of it and I am sure."

On 14 June Napoleon joined his troops. On the 15th his army of eighty thousand men with the finest artillery in the world crossed the Meuse and occupied Charleroi. The nearest enemy force was the Prussian army, concentrated at Ligny, just to the north-east of the great broad stone road from Charleroi to Brussels. Napoleon himself attacked the Prussians on the 16th and sent Marshal Ney towards Brussels.

As soon as Wellington heard that the French were about to attack the main Prussian force, he sent forward a brigade to Quatre Bras, which is about halfway between Brussels and Charleroi, and ordered a general advance. On the night of 15 June the Duke and many of his officers were at the ball given in Brussels by the Duchess of Richmond which has been made famous by Byron's great poem.

When the sound of distant cannonading at Quatre Bras became just audible in the ball-room, the British officers left as inconspicuously as possible.

The Duke himself was very cheerful and unconcerned; he rode through the rest of the night to Ligny to consult with Blücher and then afterwards, early the next morning, joined the British forces at Quatre Bras. Wellington was a man of few words and it is said he was unusually taciturn when he talked with Blücher beside a windmill near the battlefield. It was agreed that whatever happened the two armies, although they were now being separately attacked, should not lose touch. Wellington thought Blücher's plan of battle at Ligny was a bad one. He said nothing, however, until one of his staff officers asked him what he thought. He answered, "If Blücher draws his men up like that, he'll get damnably mauled".

The Prussians at Ligny were "damnably mauled", but retreated in good order. On the 17th, in the pouring rain, the British retreated too and took up their positions on a wooded ridge, the Mond St Jean, in front of the forest of Soignies. They were followed by the bulk of the French army with Napoleon in command who posted their guns on a ridge facing the British.

As dawn broke on Sunday, 18 June, it was still pouring and on both sides colonels and generals were peering through their telescopes. The battle, and this was much to the disadvantage of the French, did not begin until around 11.00 a.m., for although the rain had stopped much before, the fields and lanes were too miry to allow large bodies of men to move swiftly. Right through the centre of both armies ran the road from Charleroi to Brussels, and Napoleon's headquarters were set up on this road at a farmhouse called La Belle Alliance. The village of Waterloo, which gave its name to the battle, lay just behind the British lines.

The battle which followed was one of extreme simplicity. It consisted of a series of attempts by Napoleon to break the British line, attempts all of which had some initial success but which were finally defeated by the steadiness of the British infantry. As morning turned to afternoon Napoleon became aware that on the right of his army new forces were entering the field. At first he thought it was Marshal Gruchy, whom he had detached with 32,000 men to follow Blücher and the Prussian army which he thought was defeated. But gradually Napoleon realized it was the Prussians. All was not lost for he believed he could still break Wellington and advance on Brussels.

At around half past three in the afternoon he hurled the larger

part of his great cavalry force at the left of the British (Wellington's right). Above Hougoumont, a small farm held by the British which the French had failed to capture, charged line after line of French lancers, hussars and cuirassiers. In this part of Wellington's line the British guns were in front of the infantry. The French cavalry in most parts overran the guns, slashing the traces and, when they had time, spiking the cannons.

But triumph was followed by disaster. Time after time the cavalry squadrons charged the squares of British infantry and in vain—the sabre against the musket could only triumph if the morale of those who held the muskets was low. The British infantryman might be the scum of the earth but when well commanded he was unbeatable.

The presence of the Iron Duke was felt everywhere about the British battle-line and invariably, wherever the fighting was hottest, he trotted up on his horse Copenhagen and, with a few remarks devoid of eloquence but to the point and charged with feeling, steadied his troops. To one square, dreadfully weakened by French heavy cavalry who had sabred their way to the middle of it and about to be attacked again, he rose up suddenly and said: "Stand firm, my boys, what will they say of this in England." To officers appealing for leave to draw back or for reinforcements he was blunt and matter of fact. "My plan", he said to an anxious officer who asked about what was to be done if he were killed or wounded or taken off the field, "is simply to stand my ground here to the last man."

Napoleon on the other hand did not move about until the end of the battle. For most of the battle he sat at a table on which was spread maps and plans on a small eminence outside La Belle Alliance. When the failure of his cavalry to break the English right had followed the failure of Ney on the eastern side of the battle, he decided on his last throw—the Old Guard. The charge was to be made principally in the centre of the British line of battle where the French had gained a considerable success in capturing the small farm of La Haye Sainte. But by now Napoleon knew that the situation was desperate, for a large part of the French army was now standing at right angles to the British line on the heights and defending itself from the Prussians.

Napoleon mounted his white horse as the Old Guard filed past him, full of courage and shouting "Vive l'Empereur". For in this battle what distinguished the French and British was will and enthusiasm, which was the more surprising considering the long time the civilized world of Europe had been at war. Between seven and



eight o'clock in the evening (remember it was June and the days were long) the Old Guard poured into La Haye Sainte, and dashed up the crest of the hill. They lost many men from the British guns before they reached the crest of the hill, but hundreds of them arrived at the top and then through the smoke—nothing.

It was then that the Brigade of Guards commanded by General Maitland rose to their feet and poured salvo after salvo into the French mass which grew larger moment by moment as more battalions arrived at the top. The British had been told to lie down until the crucial moment, the better to avoid the deadly French cannon. It was, it is said, the Duke himself who gave the order: "Up Guards and fire low!" as the French mass began to pour over the hill-top. French officers displayed the greatest contempt for danger, and again and again rallied their men for one more attempt to break the British. But in vain. French generals who watched the battle could not believe their eyes when they saw the Old Guard flying rabble-like down the hill.

The Duke of Wellington gave the order to advance all along the line. The British charge took place just at the moment when Prussian cavalry was pouring on to the battlefield. Napoleon at first intended to die in the field. A square was formed around him and a group of French generals, but at the last moment Marshal Soult persuaded him that his capture would only add to the good fortune of the British. He allowed himself to be persuaded to fly.

The Iron Duke was still on the battlefield when the enemy's resistance was over and the Prussians were in full pursuit. He appeared sad and heavy in spirit as he gazed on the thousands of dead and wounded lying on the slopes and in the valley, and as he inquired after his friends and the officers he knew. In a letter to a friend which Wellington wrote immediately after the battle he expressed his feelings in noble and simple words:

"My heart is broken by the terrible loss I have sustained in my old friends and companions, and my poor soldiers. Believe me, nothing except the battle lost can be half so melancholy as a battle won; the bravery of my troops has hitherto saved me from the greater evil; but to win such a battle as this of Waterloo, at the expense of so many gallant friends, could only be termed a heavy misfortune but for the result to the public."

Waterloo ended the cycle of wars which had begun with the victory of the French Revolution's army at Valmy in 1793. It meant the triumph of the autocracies and of conservative England. Germany was returned to its princes, fewer in number than at the end of the

eighteenth century but still one hundred and forty sovereign states. Italy remained under the heel of Austria and the Bourbons came back to Naples. There were mitigations. The Holy Alliance of Austria, Prussia and Russia paid lip service to progress and created a Federation of the States of Germany—the Diet of Frankfurt—one of the aims of which was to ensure that every State had ultimately a liberal constitution. In France, the Bourbons returned to govern but with a charter which guaranteed democratic rights. The work of the Congress of Vienna ensured peace in Europe for forty years; it also meant that German and Italian unity had to be achieved eventually by war.

Above all Waterloo marked the beginning of British predominance in Europe and throughout the world, which was to last for close on a hundred years. It was to be the British century just as the eighteenth and the second half of the seventeenth had been French. The British Empire was to reach its greatest strength and its fleet was to maintain the *Pax Britannica* throughout the world. It was to Britain that European patriots and progressives now looked; for although British statesmen promised no dazzling dreams of universal freedom or of European unity, Britain alone of the great powers had a liberal constitution and only in Britain were men accustomed to political liberty.

## *The Vision of Robert Owen*

### *Towards the Welfare State*

ROBERT OWEN is famous for many things. He is one of the classic examples of the poor boy who has made good. A great captain of industry, he became the father of enlightened capitalism, whose establishment at New Lanark on the Clyde was the inspiration and forerunner of the Port Sunlights and Bournvilles of a hundred years later. He saw nothing wrong in making money and himself became rich when still a young man, but he was never tired of impressing on his colleagues and business associates that the wealthy had duties and responsibilities towards those less fortunate in life's struggle.

His attitude towards his employees was that of a benevolent dictator, who was fully persuaded that he knew what was good for them far better than they could know themselves, and yet it is hardly possible to exaggerate his services to the cause of working-class emancipation, since he was a pioneer in the fields of co-operation, trade unionism, and the Socialist movement. He was also an educationist of the most enlightened type, far in advance of the thinking of his age, for no man had a firmer belief in the power of education to transform the world, and the human beings in it. The first infant schools, it may be remembered, were established at his works.

All these things entitle him to a proud place on the roll of human benefactors, and still there are other aspects of his extraordinary career that call for mention. Not the least of these is his advocacy of Factory Legislation, that is in the direct line of succession to the Welfare State of to-day.

When he was born in 1771, the factory system was in its infancy in England and in Scotland, and was practically unknown elsewhere. The first factories were worked by water-power, and they were established necessarily on the banks of rivers and streams very often in places far from the haunts of men. Labour supply in these circumstances was hard to come by, and it is not surprising that the manufacturers welcomed the opportunity of employing

the little children that the workhouse authorities of London and Birmingham and other great cities wanted to get rid of.

For many years the workhouses exported their waifs to the manufacturing districts to serve as apprentices, which was a much nicer-sounding word than slaves. But slaves they were, as some of the cotton kings themselves admitted. "There is abundant evidence on record", wrote John Fielden, master of a great factory at Todmorden, "that cruelties the most heartrending were practised upon the unoffending and friendless creatures who were thus consigned to the charge of the master-manufacturers; that they were harassed to the brink of death by excess of labour, that they were flogged, fettered, and tortured in the most exquisite refinement of cruelty; that they were, in many cases, starved to the bone while flogged to their work, and that even, in some instances, they were driven to commit suicide to evade the cruelties of a world, in which, though born to it so recently, their happiest moments had been passed in the garb and coercion of a workhouse."

All this was well known to Robert Owen, and he accepted it almost as a matter of course. Not that he was ever a child slave himself, for although his father was only a saddler and ironmonger in a small town just over the border in Wales, he was so fortunate as to be sent to school from the age of four until he was nine, by which time he had learnt all that they had to teach. When he was ten he persuaded his parents to let him join an elder brother in London and was found a job in a draper's shop, where he stayed three years, acquiring an intimate knowledge of stuffs and some understanding of that most difficult of all materials to understand, human nature. At twenty he was manager of a cotton mill in Manchester, and although he knew absolutely nothing of the business to start with, it was not long before he was acknowledged as one of the most expert and knowledgeable cotton spinners in the country.

In Manchester he gathered a vast amount of first-hand information about the human element in industry, but his testing-time came in 1800 when he became a partner in the famous firm of Dale and Arkwright and assumed the managership of their works at New Lanark, on the Falls of Clyde. Here he was put in charge of a labour force of some two thousand, men, women, and little children of both sexes. And what a dreadful lot many of them were! They had been recruited from anywhere and anyhow, and, since the reputation of cotton mills was such that no decent folk would accept employment in them save as a last resort, quite a considerable

proportion of them were drawn from the dregs of the population. Most of them lived in a shanty town at the mill gates, and, as Owen himself put it, they formed "a wretched society, in which every man did that which was right in his own eyes, vice and immorality prevailed to a monstrous extent, and the population as a whole lived in idleness, poverty, and almost every kind of crime, and were in consequence generally in debt, in poor health, and miserable".

The only comparatively bright spot in the picture was the apprentice-house in which were housed the children who had been assembled from the poor-houses and charitable institutions of Edinburgh and Glasgow. There were between four hundred and five hundred pauper children on the staff, most of whom had been engaged at the age of five or six. They were well treated on the whole, since Mr Dale was one of the most benevolent of employers; but since their upkeep was expensive, it was deemed necessary that they should be made to work in the mill from six o'clock in the morning till seven in the evening, summer and winter. After their day's work they were expected to attend evening school. However well intentioned, such a system was bound to have the most unfortunate results, and indeed many of the children became, as Owen recognized, "dwarfs in body and mind". They had one chief object in life, to obtain their liberty as soon as possible, and it was a common event for children to decamp and make for the city, where they soon fell prey to the innumerable temptations and dangers of the place.

Owen was not daunted by the problems that confronted him, because he was not in the least surprised. As a boy he had worked out his own individual philosophy, and he stuck to it throughout his long life. Briefly stated, it is that human character is made by the environment in which the man or woman is placed. If we want to breed a race of decent people, then we must create decent conditions for them to breed in.

For sixteen years Owen strove at New Lanark to give his philosophy practical expression. One of the first things he did was to order the overseers to stop strapping and whipping the children who had made a mistake. Then he stopped the in-flow of pauper children from the workhouses, and refused to employ any child under the age of nine or even ten; he would have liked to make the age twelve, but the parents insisted that they must find jobs for their offspring at as early an age as possible. He opened village schools, and evening-classes for the adults. He improved the housing of the work-people, and opened shops in which they could buy the necessities of life at

cost price. He put severe restrictions on the sale of strong drink. He stopped thieving in the mill by an efficient checking system, and encouraged good work by keeping a careful record of each person's conduct, in which a bad mark came to be regarded by the worker himself as something of a disgrace.

All those who thought they knew everything worth knowing about the art of manufacturing prophesied disaster, but Owen never had the slightest doubt that he was on the right track. What was wrong with his critics, he averred, was that they knew so little about human nature. People are rational creatures, he maintained; treat them like rational creatures and they will act rationally. That was what he did, or at least tried to do, and soon it had to be admitted that his belief was reaping a rich harvest in high profits and big dividends.

Not that this was any great satisfaction to Owen personally. He was not interested in making money, although of course he insisted that the business must pay its way. But he felt that he had proved his point, and now he contemplated carrying his gospel into the wider world. So in 1815, when the Great War with Napoleon had ended, he called a meeting of the Scottish manufacturers in Glasgow, and put before them a programme of two propositions: in the first place, to urge the Government to remit the heavy import duty on cotton, and secondly, "to consider measures to improve the condition of the young children and others employed in the various textile manufactures now so rapidly extending over the kingdom".

The meeting was presided over by the Lord Provost of Glasgow, and was very numerously attended, for the "philanthropic Mr Owen" was now a nationally known public figure. The assembled manufacturers listened to what he had to say with deep attention, and when he put his first proposition to the meeting it was carried unanimously by acclamation. "I then proposed a string of resolutions to give relief to the children and others employed in cotton, wool, flax, and silk mills . . . and not one would second my motion." Whereupon he declined to proceed with the business of the meeting, and it therefore came to nothing. "But I told them I should take my own course in both measures, independently of them."

Very likely it was now that he realized that something more than an enlightened attitude on the part of individual manufacturers was required, that a good example—even such an excellent example as he had given over the years at New Lanark—was not sufficiently "catching". He proceeded forthwith to London, and sought to interest some members of the Government in his proposals. "I

waited personally on the leading members of both Houses, and explained to them my object, which was to give some relief to a most deserving, yet much oppressed part of our population."

He received many promises of support, and among those who offered their assistance was Sir Robert Peel, a highly successful member of the manufacturing class who yet had been responsible in 1802 for an Act designed to improve the condition of child apprentices in mills and factories. This Act had proved to be quite ineffective in practice, and Peel was ready to try again. Owen had already prepared a draft Bill, but he was persuaded to leave the matter in Peel's hands, and very soon he wished he hadn't. Peel was full of sympathy and encouragement, but he was dilatory in action, with the result that the opposition among the manufacturers had time to rally and present their case. There ensued a great deal of lobbying, to use a modern term, and at length Peel—very unwisely, in Owen's opinion—agreed to the setting up of a Select Committee to investigate the whole matter.

The Report of this committee is an historic document, and after the lapse of nearly a hundred and fifty years still makes fascinating reading. A large number of witnesses—manufacturers, work-people, doctors, sincere philanthropists and busybodies—were called upon to give evidence, and much of what they had to say was deplorable. At this time, as Owen emphasized, children were put to work in the textile mills at six, and sometimes five, years of age; while as for the time of working, summer and winter, it was unlimited by law but was usually fourteen hours per day, although in some mills it was fifteen or as much as sixteen. In many cases, the mills were artificially heated to a degree highly detrimental to health, and the sanitary conditions were best left undescribed.

Owen gladly offered himself for examination on more than one occasion, and his evidence was characteristically authoritative and pungent. In the end it was decided that a case for legislation had been made out; a Bill was prepared, and went through the various stages of the parliamentary procedure without much opposition.

Owen might have been expected to have been pleased, but in fact it was far otherwise. The Bill was a sadly watered down version of his original draft, and it had been rendered even more ineffective as it passed through the House. His Bill would have prohibited children working in the mills under the age of ten, and he would have liked to have made it twelve, but the Act merely fixed the age limit at nine; he wanted to limit the hours of work for all under eighteen to ten and a half hours a day, exclusive of meal-times, but

the Act forbade any young person to be employed more than twelve hours a day, exclusive of meal-times; he urged the appointment of properly qualified and State-paid inspectors to see that the rules and regulations were carried out, but the Act left the matter in the hands of the local magistrates, as had been the custom in the past; and whereas Owen had proposed that practically all textile mills employing more than twenty persons should be brought within the Act's cover, it finally took account of cotton mills only.

Owen was bitterly disappointed; if only he himself had been in the House of Commons, he thought, things would have gone far differently. As it was, he was so disgusted that he washed his hands of parliamentary action, and henceforth gave his attention to what he thought might well prove to be a much more fruitful line of advance, by way of the infant working-class movement—trade unionism of the most comprehensive type, co-operation of producers and consumers, and (the bee that never stopped buzzing in his head, and buzzed to small purpose) the establishment of model villages or colonies in which employers and employed would be the same persons, with identical interests and activities.

But he need not have been so downhearted, even though his most gloomy predictions concerning the Act came to be realized, since its provisions were largely evaded, as those of the earlier Act had been. Even so, a beginning had been made, and there were plenty of able men in politics and industry who were determined that eventually the new legislation should be made to work.

There was something else, however, full of promise. When Owen had addressed that meeting in Glasgow, he had invited the assembled manufacturers to ask the Government "to consider measures to improve the condition of the young children *and others* employed in the textile factories"; and he lived long enough—he did not die until 1858—to see a vast extension of factory legislation covering not only children and young persons—the classes which had aroused his concern in the first place, and were always nearest his heart—but of women, and incidentally of the men who were employed alongside them in the mills.

Nor was this all. Very gingerly at first, feeling their way very carefully step by step, but with increasing momentum, the Legislature set about the regulation of industrial life in all its aspects. From textile mills they extended their activities to iron-works and potteries and coal-mines and all the other fields of labour. From enforcing good conditions of work they proceeded to improve the state of the towns and public health in general. Slowly there emerged



something that we know as the national minimum, a standard of life below which no member of the community should be allowed to fall, and the provisions of which were laid down by Parliament and enforced through the courts. Altogether it is not too much to claim that the Welfare State of to-day may be traced back to that speech of Owen's that evoked such a mixed reception. The little Welshman had builded better than he knew, or even had dared to hope.

## *The Stockton and Darlington Railway*

### *First of a Network that Shrank Continents*

THERE HAD been "railways" for years. The first, or so men believed, had been in the reign of Charles I. Shortly before they hacked off his head—or perhaps long before that occurred to them, it made no matter—some of the king's subjects had discovered that it was easier moving coals, in a Newcastle colliery, if the little waggons travelled along planks laid on the ground. In this way there was no danger of a wheel getting stuck in a rut, which happened occasionally, flinging the waggon on its side while cursing miners scrambled to put the coal back in again.

But, by 1825, this was considered fairly primitive. Proper metal rails were now laid and fastened to heavy wooden "sleepers". Coal—or anything else—could be moved at speed for as far as the railway went, by men pushing, by horses pulling. They looked, these horse-drawn railways, for all the world like horse-drawn barges on a waterway. If you lay down on the ground, so that grass hid the wheels from your gaze, it was exactly like a barge, a string of barges, being towed by a horse. So the men who laid the track—and busy men they were, track was being laid at every colliery—became known, tongue in cheek, as "navigators", then "navvies".

The colliery owners of Durham had wanted an efficient, speedy way of getting their coal to the port of Stockton, whence it could be shipped to London, and they built an impressive, twelve-mile railway to achieve this. Furthermore, though they intended that some of the traffic would be horse-drawn, they planned to use one of George Stephenson's "steam locomotives" for their coal traffic. One or two of these amazing engines were in use at collieries, notably at Killingworth; now, for the first time, they would be asked to travel cross-country. There would be passenger traffic on the new line, but this would still be horse-drawn; occasional carriages of passengers would be slipped in between the scheduled coal trips; no passenger would be likely to submit to the barrage of filth which rained down along the whole of the train, from its locomotive's smokestack.

And so, one day in 1825, the inhabitants of Stockton were startled and deafened to witness the arrival of a train of waggons, piled high with coal, and towed by a puffing brute in front, a glowing, red-hot funnel in its back and a hellish mixture of black smoke and white steam belching from it. Women screamed, small boys shouted, old men shook their heads. The steam railway had come—and for over a hundred years it would remain.

This terrifying train made its way, laden with coals in one direction, usually empty in the other (apart from the occasional small boy who dared slip into a waggon when the "guard" wasn't looking), and soon it became accepted as part of the normal way of life. Local people became exceedingly proud of it—as well they might: the first steam railway to travel from one place to another, not just in circles inside a colliery, was theirs, and however many others might emulate it the honour would remain.

And others did. A similar railway was opened, for goods only, between Canterbury and Whitstable, and a more ambitious undertaking, a line to carry goods *and* passengers, started building between Liverpool and Manchester.

The railway builders had their troubles, not the least of which was getting permission—which necessitated an Act of Parliament—to run their lines over other people's land. The Stockton and Darlington Railway Bill was defeated by Lord Darlington himself, who had stated in no uncertain terms that he would not countenance such a thing over his fox coverts. He then learnt from a messenger, while he was actually in the hunting field, that the Bill was before Parliament. He galloped home, boarded the stage-coach and reached London in time to arrange the Bill's defeat. Eventually, in order to get a revised Bill through, the promoters of the railway were obliged to make a very considerable detour, leaving the foxes undisturbed.

Passenger traffic, but all of it horse-drawn, flourished on the Stockton and Darlington, between puffing trainloads of coal. Most of the passenger carriages, which were drawn singly by a horse, were privately owned, their owners paying rent for the use of the rails, and many of them were luxurious affairs. The company had laid their rails superbly, and only the slightest effort seemed to be necessary on the part of the horse. Indeed, most onlookers remarked that the horse's tow-rope seemed always to be slack, that the carriage with its score or so of mortals within seemed to be moving along, independently, behind.

This then was the world's first public steam railway for the

conveyance of goods, but perhaps of greater significance is the Liverpool and Manchester. This was the first railway to work all traffic, passenger and goods, by steam power. It opened five years after the S and D, in 1830, and the opening was a disaster.

No less a personage than the great Duke of Wellington had been invited to perform the ceremony. It was a chill, blustery day in September, and to the discomfiture of a large audience which included dignitaries both local and national, the Duke and the procession which was to bring him by rail, from Liverpool, was extremely late. There were angry shouts, the audience grew restive, someone threw a brick.

Then, but in pitiful instalments, came the procession. The second instalment, which arrived a moment after the first had steamed into the new station and steamed out again, contained the Duke. He was in a large carriage hung with crimson cloth and velvet, he was standing up, looking more than usually fierce, touching his tall hat to a hostile, jeering crowd.

And before the Duke or anyone else could make a speech, this second train puffed out of the station and headed back to Liverpool.

By this time the crowd was mad with rage and by the time the truth was known most of them had left for home. William Huskisson, one of the Members of Parliament for Liverpool, who had been travelling in one of the several trains which formed the procession, had got out at a halt, been run over by an engine. He died that night, after having been rushed, by George Stephenson himself, driving the engine "Northumbrian" which had in tow a flat open carriage, intended for a brass band, full speed to the Rectory at Eccles, where he died.

Huskisson had been the railway's most ardent supporter in Parliament. Now he was dead. Hardly an auspicious start.

In a way, the accident showed the power of steam. Poor, dying, Huskisson, lying on the floor of his "band-waggon", was rushed by Stephenson a distance of fifteen miles to Eccles, in just under twenty-five minutes—a speed of thirty-six miles an hour.

But after this shocking start, the Liverpool and Manchester Railway became hugely successful. The directors were amazed at the number of passenger bookings: everyone wanted to travel behind the Iron Horse. Engines and carriages worked non-stop, coping with the demand. By the end of 1830, three and a half months after its opening, the L and M had carried 70,000 passengers; within eighteen months it had carried ten times that number. Net receipts by 1835 were £80,000 a year—£20,000 more than expected.

George Stephenson's "Rocket" gave its name to a whole class of similar locomotives, but the last one was built at the end of 1830 and superseded by his "Planet", a more advanced design upon which all subsequent British steam engines have been based. The "Rocket's" driving wheels had been at the front, with cylinders at the rear; the "Planet", like surviving present-day steam locomotives, had cylinders at the front, was far more efficient.

Despite the success of these railways (and new ones, with no consideration of fitting into any sort of national scheme—no-one looked that far ahead—were being opened every year) many people doubted whether mechanical railways had come to stay. They were dirty, they were dangerous, they were noisy—and they were expensive to build. A horse was none of these things. Within a few years all that expensive equipment would have worn out and rusted away, and the companies—serve them right—would go bankrupt. Certainly the early equipment wore out quickly, working at red heat. George Stephenson, when asked what effect the sight of the "Rocket's" red-hot funnel would have on cattle, is said to have replied, "I doubt, sir, whether a cow would realize the funnel was not painted red." His "Rocket", much tired by its exertions, was sold in 1837 and used a few more years in a colliery before being put out to grass. Eventually it found its way to the Transport Museum, Clapham.

By this time most railway equipment had greatly improved, the two exceptions being signalling equipment and brakes. There were still top-hatted men standing along the route controlling traffic by an upstretched arm, not yet replaced by the semaphore signal. And at first, when semaphore was introduced, it was merely in order to "lengthen" the signalman. He stood there and operated his signal on a pole which could be seen farther than his arm. Then the idea of signals, and even points, operated from a distance became universal.

The steam locomotive opened up great tracts of the world. In January, 1831, only a few months after the Liverpool and Manchester, the South Carolina Railroad opened in the United States, and from this was to spread a system of railways which spanned that vast continent—though, as in England, little thought was given to the eventual co-ordination of lines. They proliferated, there was great jealousy among the various designers, and they had different gauges. The gauge still used in Britain, 4 ft. 8½ in. across, came more or less by accident; that was the width of an existing horse-drawn waggon-way in the Killingworth Colliery. Stephenson's first loco-

motives were built for this colliery, and it was natural that he should continue with this gauge when laying out the Stockton and Darlington—not with the intention of linking up one with another, but in order to use his own locomotives without alteration.

One man who refused to adopt this gauge, who thought always in the largest way about everything, was Isambard Kingdom Brunel, "The Colossus of the Railways". He built the main line from London to Bristol and went on to build a number of smaller lines for the West Country. For these, nothing less than seven feet would do, nothing less would be capable of carrying the enormous loads, at immense speeds, which Brunel was considering. These lines were subsequently altered to fit Stephenson's narrower gauge (which has proved satisfactory in Britain at speeds of well over a hundred miles an hour), and now Brunel is best remembered as the builder of superb railway bridges, many of which are still used.

When Queen Victoria made her first railway trip from Slough to Paddington, the Locomotive Superintendent of Brunel's Great Western Railway was driving the engine and Brunel was with him on the footplate. The queen was delighted with her experience, but the next day a newspaper, summing up the mood of a large part of Her Majesty's subjects, said: "A long regency in this country would be so fearful and so tremendous an evil that we cannot but desire in common with many others, that these railway excursions should be if possible either wholly abandoned or only occasionally resorted to."

Speeds mounted. Thirty, even forty, miles an hour became commonplace, an alarming speed for men and women used only to the stage-coach, but the "permanent way" had greatly improved and "rolling stock" with it. Brakes, as we have seen, lagged behind, and there were a number of serious accidents when they either failed or proved inadequate. One of the chief hazards was a broken coupling between carriages, which would leave half the train at the mercy of whatever slope it was travelling, leave it to plunge out of control and wreck anything else on the line. Nowadays all passenger trains are fitted with extremely powerful automatic brakes which are coupled so that a break between carriages stops both parts of the train.

The steam engine has yielded pride of place to the electric and diesel-electric locomotives. Both of these are cleaner, less noisy, cheaper to run, than their predecessor, but electric trains require large capital outlay in the shape of overhead wires or extra rails to carry the current, and the diesel-electric, a long-term stop-gap in

## THE STOCKTON AND DARLINGTON RAILWAY

most countries, is a common sight on the world's railways. In this, a diesel engine generates electricity with a dynamo and feeds this to electric motors which power the wheels. (A diesel engine cannot satisfactorily power the train direct; it requires, like all internal combustion engines, a system of gearing, which is unsuited to the heavy duties of a locomotive.)

In many parts of the world, notably Britain, railways are having difficulty in meeting the challenge of road and air transport. Perhaps, eventually, they will die altogether, their ostensibly "permanent ways" being replaced by roads.

In Britain, proud of having had the first railway—and the first steam engine—there has always been a strong railway tradition handed down for years by men who gave their lives to the design and working of great railway networks. That tradition—like the railways themselves, the "Iron Horses" which opened up a strange, exciting world to its inhabitants, took Central European settlers to the Middle West of America, Englishmen to the heart of Australia, opened up frontiers all over Europe—will be a long time dying.

## *Faraday Discovers Electricity*

### *The Transformation of Everyday Life*

"PROMETHEUS, they say, brought fire to the service of mankind; electricity we owe to Faraday."

The remark has been made, in our time, by a man who ought to know, Sir William Bragg, winner of the Nobel Prize for physics, holder of a great many other distinctions in the world of science.

And yet this is an astonishing claim, for without electricity the world we live in would be unrecognizable, a world lit by gas lamps and candles, without telephones, radio, television. A horizontal world, for without the electric lift no architect would dare design a building more than three or four floors high. Our spring-driven, needle-powered gramophones would squeak at us through trumpets. Our motor-cars—if, so deprived, we had ever got round to inventing them—would be clumsy, diesel-powered things, with acetylene headlamps, and when we refilled their tanks with diesel oil we would do it, laboriously, by hand pump.

One could go on for ever—for almost everything in our twentieth-century world needs electricity for its functions or its manufacture. How accurate, then, is the claim that we owe all this to Michael Faraday, the nineteenth-century London book-binder who was fired by a lecture on "natural philosophy" and never rested until he had invented half the things we use to-day? What sort of a man was this Faraday, who could do such things?

He was born in London, in 1791, son of a blacksmith and his wife who had walked down from the Yorkshire moors in search of work. They were only partly successful, and from an early age the young Faraday had been forced to go out and earn what he could to augment the meagre family income. When he was nineteen and working as a book-binder, his father died, leaving him to support a widowed mother and a young sister. He might well have remained a book-binder if his employer, a kindly man, had not encouraged him to use his off-duty hours to the best advantage and urged him to attend lectures on the "natural philosophy" we now call science. It was at one of these lectures, at the Royal Institute, that he heard



Sir Humphry Davy. He was so overcome with the wonder of what he heard that he sat down and wrote the great man a letter, enclosing a copy of the notes he had made of the lecture which so enthralled him.

To his delight, Sir Humphry wrote back, on Christmas Eve, 1812. "I am far from displeased with the proof you have given me of your confidence, which displays great zeal, power of memory, and attention. It would gratify me to be of service to you; I wish it may be in my power."

It was within his power—sooner than Sir Humphry had anticipated. His assistant at the Royal Institution was dismissed for assaulting the instrument-maker; the astonished Faraday was offered the post, at a salary of twenty-five shillings a week and two rooms at the top of the house.

His life and work with Sir Humphry and Lady Davy was stimulating and at times exasperating, but he served his master well, not only in London, but on a long and eventful trip about the continent, where Davy lectured in many capital cities and young Michael Faraday was able to meet and talk with many of the great men of science, including Monsieur Ampère and Signor Volta, whose names were becoming—as they have remained—household words in the science of electricity. Faraday had served Davy—whom he worshipped—extremely well as "philosophical assistant" in experiments with chemistry and physics, but more and more he was being drawn to the study of this strange electric force which seemed to exist everywhere, to be conjured out of almost anything, like rabbits from a hat, and which, unlike the rabbits, seemed to promise a new strange magic—once man learnt to control it.

On their return from the continent, Sir Humphry arranged his promotion to a salary of thirty shillings a week which would now enable him to send his mother enough to afford good schooling for his sister. He settled down, in a mixture of enthusiasm for the work in hand and relief that he no longer had to suffer Lady Davy, who throughout their travels had treated him as the most menial of servants, to work as he had never worked before. He was torn between chemistry—he had already, without bothering to explore its commercial possibilities, invented stainless steel—and the study of electricity. In his heart he knew he could abandon neither, but the fact that Sir Humphry was now switching his efforts to the latter made his choice for him; he had to help his master.

In the autumn of 1820 the Danish Professor Oersted had experimented with compass needles—pieces of magnetized steel—held

near to wires carrying an electric current. The needles, Oersted found, were deflected by the current and when this was switched off they fell back into their normal, north-south orientation. Others, including Davy, had proved that steel needles, which had always previously been magnetized by rubbing with a lodestone or natural magnet, could be made magnetic if held long enough beside a wire carrying an electric current.

It now became clear to Faraday that there must be a measurable relationship between the current and the magnetism. At the same time he was forming in his own mind the theory, soon to be proved, that "electricity, whatever may be its source, is identical in its nature". This included the electricity which Benjamin Franklin had enticed down his kite-wire from a flash of lightning, the current from Signor Volta's battery, the "static electricity" produced by rubbing amber. None of this, as yet, had a use; Faraday was soon to change all that.

One day he balanced a small bar magnet upright in a bowl and poured in mercury, so that only the top of the magnet protruded above the surface. He then led a wire from one terminal of his electric battery to the mercury—a liquid which conducts electricity—bent it over the edge of the bowl and let it stay there, submerged. From the other battery terminal he took another wire which ended in a straight piece which he suspended from above the bar magnet and allowed to dangle in the mercury. There would thus be an electric current flowing from one battery terminal to the other, through the mercury.

He had left one terminal unconnected and now he joined it up.

The end of the straight wire, dangling in the mercury, began to spin around the bar magnet, in a neat circle.

He disconnected the terminal and the movement stopped; re-connected, and it began again; the first electric motor had been made, had been running. Not, as Faraday was the first to admit, a motor which had an immediate practical use, unless one wanted to stir mercury—but a motor, a device, of unlimited possibilities. But then, instead of developing it, Faraday went straight on to investigate more fully the behaviour of electric currents near magnets, of wires near wires, of wires in the earth's magnetic field. He found that he could produce a movement similar to that of his experimental motor by using terrestrial magnetism instead of the bar magnet.

By now, having proved to himself that an electric current in a "magnetic field" could produce a mechanical movement, he was anxious to prove the converse, that the movement of a piece of wire

in such a field would generate an electric current along that wire. He tried, many times, connecting the two ends of his wire to a sensitive, current-indicating, galvanometer, placing the wire near a strong magnet, but nothing registered. Yet he was becoming convinced that not only was this possible, if one worked out the correct positioning, but that the same process of "induction" would be able to make a current flow along one wire when it was brought near another along which current from a battery was already flowing.

The results were negative and exasperating, but he refused to give up. As he wrote, he "could not in any way render any induction evident"—yet he was convinced it was there.

On 29 August, 1831, he succeeded. He had taken an iron ring, six inches in diameter and an inch thick—a large, hollow iron doughnut—had wound a few turns of insulated wire round one half of the ring, a few round the other, had connected one lot to a battery, the other to his galvanometer. When he joined up the battery, when he disconnected it again, there were sharp flicks of the galvanometer needle. When the current from the battery was flowing steadily or not at all, there was no deflection of the needle; only its interruption or resumption (and, as he soon found, an increase or decrease in its strength) had an effect. There was—because of the insulation—no electrical connexion between the two coils, only an "induction". To Faraday, it was all quite clear; the current from the battery had given rise to magnetism, concentrated by the heavy iron ring, and this magnetism, *in the process of changing*, had generated an electric current in the second coil.

A discovery of major importance, upon which the whole principle of tunable radio—separating one station from another—is based: yet at first of no practical use. Faraday raced on. At the end of October, by passing a bar magnet inside a tightly wound coil of many turns of wire, not unlike a large reel of cotton, he found he had generated a current. A galvanometer, joined to the two ends of the wire, flicked each time he moved the magnet, but remained undeflected when the movement stopped. He had achieved, at last, "evolution of electricity from magnetism"—the first dynamo.

He next asked permission to experiment with a great permanent magnet which the Royal Society housed in Woolwich. He placed a large copper disc on an axle between the two poles with a rubbing contact—what we now call a "brush"—at the centre, and another at the circumference; he rotated it. Current flowed; and now there was no doubt that this new dynamo had a real and important future.

From 1831 he improved his motor and his dynamo—though his mind was on the theoretical aspects of his science, and he was prepared to leave others to get on with the practical details—and he embarked on an almost endless series of discoveries in the field of magnetism and electricity which he formulated into rules that still apply to-day. At the same time he was able to continue experiments in chemistry and to become Fullerian Professor of that science at the Royal Institution. He had been, for some years, much in demand with commercial firms, which paid him handsomely to serve them, from time to time, in almost any capacity he cared to choose, from inventor to expert witness, but in 1831 he resolved finally to devote his life to pure research. He announced that, among other things, he would cease making the high-grade optical glass for which he had become famous; he turned his back on commerce and a very large income.

It has been argued that by cutting himself off from commerce Faraday held up the techniques of electrical engineering by fifty years; after all, men said, he had invented the motor and the dynamo by 1831, yet it was years before they became more than scientific curiosities. Yet, without this zeal of Faraday's for pure research, for finding out the answer, he might never have discovered the host of new things he did—like the science of "electrolysis", the behaviour of electricity in liquids, which enabled men to measure with extreme accuracy an actual *quantity* of electricity by the amount of metal it deposited on an "electrode" in a liquid "electrolyte"—words in common use to-day, but which Faraday himself invented, with "cathode", "anode", "anion", "cation", "dielectric" and a lexicon of others, without which the modern science of electronics would be struck dumb. His own name has been immortalized in the "Farad", the unit of inductance, of transfer of energy from one electric circuit to another, which he first demonstrated with his iron ring, and without which radio communication, radar, television or X-rays would be impossible.

So indeed it is true to say, "electricity we owe to Faraday". Men knew of its existence, dreamed that it might some day have a use, but it was Faraday who handled it, measured it, made it work.

## *The Reform Bill of 1832*

### *The First Step Towards a Universal Franchise*

AMONG THE reasons why eighteenth-century Britain became the pioneer of industrial capitalism, one of the most important was the fact that she had been heavily endowed with natural resources. The cotton industry flourished in the moisture-laden atmosphere; water-power was readily at hand in the north and north-west of England; while coalfields were not only larger than any as yet opened up in France and Germany, but were close to iron deposits and to important seaports. On these resources—coal, iron and cotton—Great Britain fashioned a civilization that in time was to become the model for other industrially minded nations similarly endowed.

Admittedly, these blessings could have gone unrecognized as such, but for centuries England had been a commercially minded country, never too proud to trade in any commodity that would turn an honest penny; always on the look-out for ways and means of increasing the national wealth by the exploitation of any object which could be made for sale.

In these circumstances it would have been virtually impossible for the British not to have turned their shrewd eye to the wealth that lay under their feet, and having appreciated its value to have set their minds to turning it to the best commercial account. This, in turn, called for inventive genius, and in this, too, the British were not lacking. That it stemmed from the realization that wealth was theirs for the picking, is supported by the fact that in the reign of George II there had been few notable inventions, whereas in the long reign of his successor—that is, after the discovery had been made—industry was so altered in character by the many inventions brought to its aid that the daily life of the great masses of the people was fundamentally changed, and all within the space of literally a few years.

The first great series of mechanical inventions began when Kay patented the flying shuttle in 1733. Hitherto the weft was passed through the warp by the weaver. It was now thrown across a much

wider space by a mechanical device which greatly increased the weaver's power of work. It was in the cotton industry that the next improvements were made, the need being for an adequate supply of yarn. (See "Spinning Jenny".)

But these new machines, from Hargreaves's Spinning Jenny to Cartwright's Loom, practically all of English origin, called for a new power. Horse power was not unknown, but the hand or the foot of the worker was still the chief motive power. It was the use first of water and then of steam that made the Industrial Revolution complete. Small sheds for the machines began to be built by waterfalls and rivers. The supply of water, however, was uncertain, and the ponderous steam-pump, which had long been used in the mines, was at last developed in 1766 into a practical engine to drive the machines of the spinners and weavers.

James Watt saw how the up-and-down stroke of the piston could best be applied to the rotary motion of the wheel and axle. His steam engine was first used in the cotton mills, and soon in all the textile industries. (See "James Watt's Steam Engine".)

The development of England's vast mineral resources, checked in the seventeenth century by the lack of steam power, now went forward with a swing. Abraham Darby had already discovered that iron could be smelted with coke, and the new era was ushered in by the use of Smeaton's blast furnace in the Carron Iron Works in 1760. This method was soon improved by the use of steam, and by Cort's invention, in South Wales, of puddling, in 1783, and his use of rollers instead of sledge-hammers in the making of iron bars in 1784.

John Wilkinson, the first of the new iron-masters, was considered iron-mad because he believed that iron could be used for building bridges, ships and houses. An iron bridge cast by Darby was thrown over the Severn at Coalbrookdale in 1779, and Wilkinson launched an iron ship on the same river in 1790.

There seemed to be no end to the uses to which iron and steel—the latter was first cast by Huntsman at Sheffield—could be put. Before this new age, England had scarcely exported any iron; in 1815 more than ninety thousand tons were sent abroad.

It was natural that the new vast iron-works should be established in the coal districts. Everywhere industries were shifting to be near the sources of power, leaving the old half-agricultural centres of industry for Lancashire and Yorkshire, the Midlands and the North. At the same time the steady drift into the towns from all the countryside, noted almost from the days when town life first began, was

now proceeding on so large a scale that soon the majority of men were leading an urban rather than a rural life.

But the population was not only shifting; it was increasing by leaps and bounds. Since the cheapening of production created an ever-growing demand at home and in the new markets abroad, in the long run the demand for male labour—and also for female and child labour, since women and children could operate easily the light work of the new machines—increased so fast that all the old prudent checks to population, where they existed, were swept away. Wages might be low, but in large families there were many wage-earners to eke out the family income.

In 1750 there were perhaps six million people in England and Wales, but in the second half of the century the population seems to have increased to nine million—by fifty per cent, that is. The first census was taken in 1801. In 1811 an increase of fourteen per cent was shown, and in the ten years following a further increase of twenty-one per cent.

The problem of feeding so large a population was a serious one, and before the end of the century it was becoming clear that the main supply of food would have to be imported. Side by side with the industrial changes, therefore, there were other changes taking place in agriculture.

A new husbandry was soon to change the face of rural England. With new grasses and winter feed roots, a scientific rotation of crops was at last possible, and the experiments of "Turnip" Townshend, Coke of Norfolk, and Bakewell, were copied all over the country. Lands were marled, manured and drained. New implements and machines lessened the labour of men and animals. Arthur Young's almost continuous insistence that "without closure there can be no good husbandry", eventually found an ear, and before the general enclosure Act of 1801 there were innumerable private Acts. Farmers could now do as they pleased with their land, and capitalists who invested in land made enormous profits. But the small farmers, who had no ready capital, were unable to compete with the great landowners, and the labourers suffered by loss of rights to graze their beasts on the commons.

The small farmers, who had been the backbone of England, gave up the struggle as hopeless, sold their farms, and found their way into the towns to seek their fortunes there, or sank into the position of agricultural labourers. Production was increased, and wealth accumulated in the hands of the few, but the "decay of men" of the lower class was a serious loss to the nation. Gangs of labourers

worked the great estates, depending now almost wholly on wages.

Early in the nineteenth century the revolution was virtually complete. The economic structure of England was altered. The great majority in town and country had become wholly dependent on wages earned in the service of others. More and more they tended to become "hands" in the ill-built, ill-ventilated and insanitary uninspected factories. Industry was directed by the factory owner. Custom based on reasonable concepts of welfare, which had once regulated all industries, gave way altogether to competition. Government interference came to an end. Labour conditions were chaotic, and no new legislation seemed possible as long as the theories of the ever-hardening science of political economy were accepted by workers and owners alike.

Gradually the great economic gulf which was fixed between men and masters began to become a basis for popular agitation. It was the greed of the owners which was fundamentally responsible for the growing unrest which sprang up among the so-called working classes. Had the owners been content with smaller profits, and had shared out the proportion remaining to those who made their great wealth possible, the difficulties which confronted the working classes—mostly on the economic front—might have been smoothed out in a more peaceful transitional period. But the increase of money in their coffers seemed to generate a compulsive desire for more.

The law-abiding Englishman was naturally inclined to seek a solution by orderly legal means, but this automatically demanded new legislation. But any new legislation would react against the interests of the wealthy, and was just as automatically resisted by them. If there were to be any legal change effected, there would have to be an enlargement of the franchise and a redistribution of Parliamentary representation; and it was in this field exactly that there had been no changes comparable with those which had taken place in industry and the consequent new social structure.

No better example of the very unsatisfactory state of affairs can be given than that of Old Sarum. Old Sarum had long been a heap of ruins, yet it still returned two members to Parliament, while the ever-increasing industrial centres of Birmingham and Manchester, already swollen by tens of thousands of new inhabitants, were unrepresented. And Old Sarum was only one of a large number of these so-called "rotten boroughs".

But the resistance to Parliamentary reform was strong, and in the first decade of the nineteenth century the hard-driven working



classes could not contain their dissatisfaction any longer and riots broke out all over the country. These were firmly quelled by the authorities on an *ad hoc* basis; but they were quite unable to stem the rising tide of demand for a new deal.

The people were not, however, without support from one faction of their leaders. The Whigs had gone into a long eclipse when Pitt and the Tories had been returned to power in 1784, and the latter had been in office ever since. It was the Tory landlords and factory owners who were against reform, though there were some even among them, including Pitt, who divined the lamentable condition of the industrial poor. The fact was that Whig and Tory alike were suckled on the religion of constitutional liberty, but the more liberal and far-sighted Tories were always prevented from bringing in reforms, despite the pressures within their party, by the wars in which they became involved from time to time.

Among the most ardent of Whig reformers was Lord John Russell, a younger son of the sixth Duke of Bedford. He had entered Parliament in 1813, and was from the outset an outspoken critic of Lord Liverpool's repressive legislation, and this, combined with an enthusiasm for reform, quickly brought him to the front. He declared for the repeal of the Test Act and for Roman Catholic emancipation, and when the Whigs were at last returned to power on a Reform platform in 1830, under the leadership of the aged Lord Grey, he joined the ministry as Paymaster-General.

By this time even the Tories had had borne in upon them the need for reform not only in the redistribution of representation, but in the enlargement of the franchise, but because the Whigs were now in power and because reform was the main Whig policy, for the time being, at all events, the Tories had to oppose it. As a result, and because there were certain of his own party who were also anti-reform, when Russell introduced his first Reform Bill in 1831 he had to drop it. Nevertheless, in the early autumn he introduced it again, and again it was rejected by the House of Lords.

Undaunted, in December, 1831, he introduced a new Bill, which was given Commons approval in March, 1832, but was thrown out by the Lords on 7 May. In protest, Grey and his cabinet resigned.

These events were signals for a formidable display of popular discontent, in which the whole country was involved. The king was shaken by the temper displayed by the people, and when the Tories failed to form an administration, chiefly because of the opposition of Sir Robert Peel who was at this time anti-reform, he assured Grey that if he would form a new administration a sufficient

number of new peers would be created to make certain that his Reform Bill would be passed by the Lords. Grey accepted, and on 7 June, 1832, the Bill became law.

It gave the county franchise to occupants of lands and tenements of an annual rent of not less than £50; the borough franchise to occupants of houses and shops of £10 yearly value; it disfranchised fifty-six boroughs, reduced the members of thirty to one, created twenty-two new boroughs with two members and twenty with one member each.

Though the new position was an advance on the old, the Bill of 1832 was merely a step in the right direction. It was, however, an extremely important step, for after it was taken the way to further reform could not be permanently blocked, though for several decades to come there were serious and some successful attempts to do this. But in 1860 Disraeli carried through the second Reform Bill, which by various provisions increased the electorate from one and a quarter million to two and a quarter million; while Gladstone's third Reform Bill of 1884 added another two and a half millions. But nearly a century was to elapse from the passing of the 1832 Bill before it could be claimed that representation was universal.

When this slow progress is noted, it is interesting to ponder on what might have been the situation to-day had not the rapid development of the Industrial Revolution virtually forced reform upon the administrators. It is fairly safe to say that the history of Great Britain since 1832 would certainly have included accounts of physical revolution such as upset the continent of Europe during that period, but from which these islands were saved.

## Refrigeration

### *Food from the Farthest Corners of the Earth*

NINETY-EIGHT days it took—right round the Horn—and sparks from the funnel set fire, more than once, to the sails.

A strange craft this, its funnel belching smoke, yet sails stretched tight and bulging up the three slender clipper masts. The steam-engine had come to stay, it was being used increasingly for the propulsion of river and coastal craft, but the smoke and steam from the pride of the Albion Line—soon to be the Shaw Savill Line—the clipper ship, *Dunedin*, served a different purpose altogether. It was initiating a revolution in shipping and at the same time a revolution in the economy of those countries the shipping served. For this sleek vessel of thirteen hundred tons was the first on the all-important New Zealand run to be fitted with the new Bell-Coleman refrigerating machine. It was this ungainly, yet remarkably efficient apparatus, still in its teething stage, which required a funnel and steam to operate it, while the ship moved serenely on, driven only by sail.

Ninety-eight days from that morning in February, 1882, when she left her New Zealand dock, the *Dunedin* docked at London. The news had preceded her, and as soon as the unfamiliar silhouette was sighted coming up the Thames, a crowd ran on ahead to watch this incredible cargo unloaded. For in her holds the *Dunedin* held five thousand frozen carcasses of lamb.

Surely, men said, it would be—if not completely rotten—at least so poorly flavoured after its long confinement that only a beggar off the street would deign to try it?

They were wrong. The meat was as fresh as the day it had been slaughtered. One only of the carcasses was damaged, had to be condemned; the rest were plump, fresh, succulent, and they sold rapidly—for sixpence halfpenny a pound, of which twopence threefarthings was the cost of freighting from New Zealand (a freight charge which has hardly altered, though the price of meat has soared). The price brought a respectable profit to the New Zealand farmer, a profit which could and would be multiplied as the new refrigerating vessels were made ready.

A new industry had been born. The refrigerating ships would not only bring great prosperity to New Zealand—and first-class meat at a reasonable price to England—but they would solve a major problem, that of disposing of the sheep. For they bred rapidly and there were not enough mouths in all the southern colony to eat them. Sheep were being slaughtered, their carcasses flung into the sea, to get them out of the way. Apart from shipping them alive to Britain—which was absurd—there was little that could be done with them, when their fleece had been shorn.

But refrigeration changed all that. Meat could be frozen immediately after slaughter, loaded on board a suitably equipped vessel and kept at a temperature below freezing point till it was unloaded in England. There was no decay, no loss of flavour.

The discovery completely altered New Zealand's economy, gave a prosperity which few could have dreamed of, which has been maintained to this day, since that first trip in 1882. To-day, there are twenty sheep in New Zealand for each citizen—but to-day there is no question of hurling them into the sea; they are frozen and shipped all over the world.

The Bell-Coleman refrigerator was not the first to be invented, and the *Dunedin* was not quite the first ship to be fitted with one, but because of the enormous length of journey, the huge part refrigerator ships were to play in the economy of New Zealand, this first voyage was a development of great significance.

The principle, of keeping food fresh in a low temperature, is old indeed. For centuries men had hacked blocks of natural ice from the frozen surface of ponds and rivers, had kept it as long as possible in shady, sheltered places, using it, piece by piece, to keep their food fresh. Parts of the world where natural ice was unknown locally could still get shipments of it from colder climates, and a regular trade built up, shipping ice from Massachusetts to the West Indies. Obviously, a great deal of the ice melted *en route*, and that which survived the journey was awkward and unpleasant to handle; it was far from an ideal method of cooling.

For tropical climes, out of reach of ship-borne natural ice, men could achieve some cooling of water by storing it in porous earthenware vessels. The water seeped out gradually and evaporated from the outside of the container, and this evaporation reduced the temperature of the water remaining. It was this method of cooling—thousands of years old—which pointed the way to our modern mechanical systems, which rely on exactly this principle. They have been extensively developed, and now mechanical refrigeration has

opened up undreamed-of fields, is used in a hundred different ways which have nothing whatever to do with food, from the shrinking of rivets by extreme cold so that they can be hammered in and allowed to expand to form an absolutely permanent bond, to the preservation of old books and paintings, and the slowing down of the human mechanism for surgery.

There are several claimants for the honour of having produced the first workable refrigerator, but the fruits of their labours have, for the most part, been lost, and we must date effective refrigeration from the patenting, in 1834, of a machine by Jacob Perkins. He was an American of an inquiring turn of mind and he experimented with much during an energetic lifetime, from the printing of postage stamps to the manufacture of high-pressure boilers. Somewhere along the line he decided to invent his own cooling device; by this time, having wearied, it seems, of his small home town of Newburyport, he had travelled as far as England, and here, in London, the first refrigerating machine was patented.

Others were experimenting with a principle which, as we have seen, dates back to man's earliest days under a tropical sun, and many variations were tried. Instead of water oozing through a porous pot, man experimented with the behaviour of all sorts of substances, from ether (chosen by Perkins) to ammonia and compressed air. All processes depended, still do, on using a substance which would easily change from liquid to vapour. Water, of course, does this, but at a temperature too high to be of much use for real cooling. In fact, there is no natural liquid which vaporizes at a temperature suitable for refrigeration; the liquid has to be manufactured, in the refrigerator itself, by compressing a gas, then cooling it, until it liquefies. If this liquid is then permitted to expand once more and become vapour, it will extract heat from its surroundings—just like the porous pot.

With Perkins's system—still typical—the ether vapour is compressed by a pump, driven by a motor, and thus becomes liquid. (This preliminary stage gives off heat, and the heat must be disposed of, *outside* the area to be cooled: in domestic refrigerators it escapes into the air surrounding the machine.) The liquid now passes to an "expansion valve" which allows it to escape into a larger chamber. Its pressure drops suddenly; it vaporizes, and in the process takes a great deal of heat from its surroundings. In refrigerating systems this suddenly chilled gas passes, in pipes, through the space being cooled—or, sometimes, is used to chill a liquid like brine which is then more conveniently piped wherever its cooling effect is needed.

There are many versions of this compression refrigerator, using different "refrigerant" gases, and they all involve some mechanical method of squeezing the gas to make it into a liquid; then, having allowed this liquid, which grew warm on compression, to settle back to normal temperature, they let it escape to a larger chamber, whereupon it becomes a gas, and extremely cold. After it has circulated through pipes, done its job of cooling, it is recompressed. The process repeats itself. In a typical example, ammonia in its liquid state at a temperature of 82 degrees Fahrenheit is allowed to expand; immediately it drops in temperature to 6 degrees Fahrenheit. Anything in the vicinity of the chamber in which this takes place, or the pipes which lead the vapour back to the compressor, will—obviously—become very cold.

The same principle, but without using mechanical compression, is employed in the so-called "absorption" system of refrigeration. In this, ammonia gas, which absorbs easily into water (at 55 degrees Fahrenheit water will absorb a thousand times its volume of ammonia vapour), is released in large quantities when that water is heated by a small gas flame or electric element. Once released this way, into a closed chamber, it soon builds up almost as high a pressure as is done mechanically with a compressor. It is then, as in the compression system, released into a larger chamber through an expansion valve and becomes very cold.

The absorption system, though less efficient, has the advantage, because there are no moving parts, of being entirely silent, whereas the electric compressor in even the most modern refrigerator is audible. (And the steam-engined compressors on the *Dunedin* could only have been deafening. Apart from this, their somewhat erratic behaviour caused the gallant captain, in an effort to rectify some puzzling fault, to freeze almost solid in a ventilator, whence he was hauled with a rope round the ankle—but he made a swift recovery.)

The science of refrigeration has made great strides since the Second World War, in four distinct but equally important lines: industrial refrigeration, medical refrigeration, domestic refrigeration and air-conditioning. The industrial uses include not only the pre-shrinking of bolts and rivets, but the de-humidifying of air for blast furnaces, the setting of concrete, the hardening of mud in mining, so it can be easily excavated, the cooling of surfaces of high-speed aircraft and missiles—and of course the common task of making ice rinks. In medicine, an artificial hibernation of the body can be induced by lowering its temperature. This "hypothermia" reduces the body's need for oxygen, so that a surgeon can cut off the blood's circulation

long enough to operate on the heart or the brain. Normally, three minutes without blood-borne oxygen damages the brain irreversibly, but under hypothermia it can dispense with all oxygen for up to twelve minutes—long enough for some brain operations.

We are all familiar with domestic refrigerators, called, unbeautifully, "fridges" in England and, nostalgically, "iceboxes" in America, the remarkable gadgets by which so many households, for a small expenditure on electricity or gas, keep food cool and fresh, make their own supplies of ice. At the same time, domestic air-conditioning is being developed, so that, soon, any household that wishes it will be able very cheaply to purchase an apparatus to keep the air inside the house as cool in summer and as warm in winter as desired, while at the same time filtering and cleaning it, so that the open casement, for all but window-boxes and eloping lovers, could become a thing of the past. On a larger scale, the industrial air-conditioner has made office and factory work enjoyable in climates where it was all but impossible.

We must not forget the rapidly expanding frozen-food industry, which now lets us buy, already frozen, many different varieties of food which may be out of season or otherwise unobtainable. Vegetables and fish can be quick-frozen in times of glut, to be consumed in times of scarcity. Whole meals, pre-cooked, can be frozen, to be consumed after only a little warming, as tasty and attractive as when they were prepared by a skilled chef, a week, a month, or a year ago.

Side by side with the development of refrigeration techniques has come the study of materials which insulate the cold space from its surroundings—for there is little use in trying to cool a box or a room or a body or a lamb chop, if heat floods back into it from outside. In the early days of shipping natural ice round the world, pine sawdust was well regarded as an insulator to be spread between the blocks; nowadays corkboard is extensively used for lining, say, the doors of refrigerators, but a whole new range of man-made substances like glass wool, polystyrene and the other plastics is coming into use. Their insulating capacities are so great that, in theory, at least, a house could be set at its correct temperature in early autumn and left that way throughout the winter, with the minimum of heating—assuming, of course, that no one was foolish enough to open the door.

And although he must have had some inkling of what his brain-child held in store for the world, one wonders if Jacob Perkins, back in 1834, could have guessed a tenth part of its possibilities?

## *The Durham Report*

### *The Principles that Saved the British Commonwealth*

THERE HAVE been two British Empires, and now there is the British Commonwealth of Nations. That, in as few words as possible, is a statement of the most remarkable political development of modern times.

The first British Empire came to an end in 1783, at the close of the American War of Independence. It is not so easy to say when it began. Should we say it was in 1583, when Sir Humphrey Gilbert took formal possession of the island of Newfoundland, in the name of Queen Elizabeth, and so founded the first of British colonies? Or was it as late as 1763, when Britain's victories in the Seven Years War with France resulted in the acquisition of French Canada, and at about the same time a little band of British adventurers brought a considerable expanse of the Indian peninsula under British rule?

The point is unimportant. Whenever it was, King George III had good reason to be proud of the extent of his dominions. So far as territory went, most of this first British Empire lay across the Atlantic, where the whole of the North American seaboard from Newfoundland to Florida was under the British flag, as well as a vast indeterminable area inland, reaching up to the Great Lakes and the shores of Hudson Bay. Then there were a number of islands in the West Indies—the Bermudas and the Bahamas, Jamaica (won by Cromwell's troops in 1655) and the rest—and some strips on the seaboard of Central America. Closely linked with these American islands were some scattered trading-posts on the coast of West Africa, which supplied the Negro slaves who formed the labour-force on the West Indian plantations.

In Asia, the eastern coast of the Indian peninsula, from Calcutta to south of Madras, was included within the commercial empire of the East India Company; and although, strictly speaking, this huge area was not part of the British Empire *de jure*, it certainly was *de facto*, since the Company operated under the patronage of the British Government at home, and could always rely on British arms for its defence and in the prosecution of its expansionist



policies. Finally, there was a little group of strategic naval stations strung out across the world, including Gibraltar and Minorca in the Mediterranean, St Helena in mid-Atlantic, and a post in the Falkland Islands in the far south.

This was the Empire that confronted the young George III when he looked at the map, and although it was small indeed compared with the realm of his grand-daughter Queen Victoria, for the times it was immense. Tremendous distances separated the component parts, and in those days of sailing-ships the distances were far more formidable than now. There was no sense of imperial unity, no imperial organization worthy of the name. The one thing that held the sprawling mass together was British sea-power, and the motive behind it all was not political grandeur but commercial greed. The overseas possessions of the British Crown were regarded primarily as sources of raw material for British industry, and as markets for the disposal of British manufacturers and other products.

In the circumstances, it is hardly surprising that it was so short-lived. Something less than twenty years saw its decline and fall, for it was in 1775 that the American colonists were driven into revolt by the fiscal blunders of the Home Government and in 1783 their independence was recognized and the United States was born. The enemies of Britain were full of rejoicing, and there were many even in England who thought that Britain's sun had set.

These gloomy forebodings were not entertained for long, however, and in fact the situation was never so black as it had been supposed. The most prosperous and promising of British possessions had broken away and set up for themselves, but there was still a great deal left. In Asia and Africa, British expansion continued, and even in America by no means all had been lost. The West Indies remained under the British flag, and, strangely enough, what had been French Canada refused to join the thirteen revolting states and preferred to remain under British rule. Some forty thousand loyalists in what had become the United States refused to live under the new government, and migrated into Canada, where they set about the establishment of new British communities in the midst of a somewhat alien environment.

The Second British Empire in this way came to birth, and it was an open question whether its rulers would be able to avoid the mistakes that had wrecked its predecessor. That they might well succeed in doing so was first shown by the Canada Act of 1791, passed by the government of William Pitt the Younger, which divided the old province of Quebec into two provinces, Upper

and Lower Canada, corresponding roughly to the Ontario and Quebec of the present. In the latter, where the bulk of the French population lived, the French language and system of law and the Roman Catholic religion were fully guaranteed; in the former, where lived the bulk of the Loyalist newcomers, English law was introduced and English ways were supreme. Nothing in the nature of self-government was granted as yet beyond what had been enjoyed by the American colonies before the rebellion; but although the Imperial Parliament was paramount, it was distinctly asserted in the Act that there would never again be any attempt on the part of Parliament in London to tax the colonies for revenue purposes.

But the real importance of the Act of 1791 lay not in what it did but in what it made possible. As Pitt's chief associate expressed it, "We will not pretend to give Canada the same constitution as we ourselves live under. All we can do is to lay the foundation for the same constitution when increased population and time shall have made the Canadians ripe to receive it." Although they did not say so in so many words, it was clear that the British Government now admitted that British citizens in Canada had a right to enjoy, in the fullness of time, the same political status as British citizens in Britain.

This promising step forward in policy was accompanied by a vast expansion in territory. Captain Cook's voyage of 1769-1770 had brought Australia and New Zealand into the sphere of world politics; the French and Dutch were beginning to cast envious eyes on the new lands in the Antipodes, but it was British sea-power that proved to be the determining factor. Australia and New Zealand were included within the British Empire, and in 1788 the first settlement was made at Sydney under Governor Phillip. The motive behind it was a severely practical one: it was no urge to imperialist expansion but the over-riding necessity to find a place into which to discharge Britain's unwanted convict population, now that they could no longer be got rid of in the colonies in America.

But before long free settlers went out to the new lands and made good there; and it should also be said that the convicts were by no means, all of them, the set of ruffians and pickpockets and street-walkers that they have sometimes been said to have been. Many a man transported to the new penal settlements had committed no worse crime than daring to stand up to the petty tyrant of his village, and in the fresh and freer surroundings he started a

new and better life. Transportation of convicts to New South Wales continued until 1840, and for another thirteen years to Tasmania, but then it was stopped altogether. By this time some measure of self-government had been accorded to the Australian colonies, mainly as the result of the acceptance of a new imperial policy that had been worked out in Canada.

When the Canada Act had been passed, it had been hoped that the two races in Canada would work amicably together and in time merge. But it had not happened thus. There had been friction and jealousy, and in both Upper and Lower Canada there was often conflict between the Executive, the members of which were appointed by the Crown, and the elected legislative assembly. It was representative government in a way, but it was not *responsible* government.

The victory of the Whigs in England and the passing of the great Reform Bill in 1832 aroused hopes in Canada that there would be reforms there also. But when the Whigs showed no signs of moving in that direction, a little group of Canadian hotheads actually rebelled. The revolt was a very small-scale affair and was soon put down, but it scared the Government in England, and in 1838 a brilliant young statesman, Lord Durham, who had been one of the authors of the Reform Bill and a member of the Cabinet, was sent out to Canada to find out what was wrong and to suggest means of putting it right.

Durham was in Canada six months, and was then forced by political intrigues against him in London to resign and return home. But in those few months he had mastered the problem, and before his lamentably early death he, and his two assistants, Gibbon Wakefield and Charles Buller, drafted what became known as the Durham Report. Briefly, this urged that the principles of the British Constitution, which had stood the test of time so admirably, should be applied in Canada as in England. Government should be not only representative but responsible; on nearly all matters, the people of Canada should have the right to decide what was best for them and how they should achieve it. Durham also recommended that the two Canadas should be rejoined, in a kind of federation of all the North American colonies, and as a first step an Act was passed in 1840 creating one large province, federation being left to a later date.

Durham's principal recommendation was accepted in theory, until in 1849 the right to responsible government was fully acknowledged when Lord Elgin, the Governor of Canada, ruled that the ministers

must be chosen from the ranks of the majority party in the Assembly and that in local matters their advice must be followed. It was a prosaic enough decision on the face of it, and yet it was of the very greatest importance. It is not too much to say that it was then made clear that the Second British Empire would not fail or be wrecked like the First—and it was the Durham Report that had established the principle that had now been recognized as the key to future progress.

Canada now moved on from the establishment of responsible government to that of national government, which was achieved in 1867, when the provinces were federated. Meanwhile, the principles of the Durham Report were applied very successfully in Australia, where as early as 1853 New South Wales was granted responsible government after the Durham model. Two years later the principle was extended to Victoria and Tasmania, and eventually to the other provinces as they grew in population and resources. In 1900 Australia became a Commonwealth, but with its components retaining rather more local power than the Canadian provinces. New Zealand achieved self-government in 1853, and was constituted a "Dominion" in 1907.

In South Africa a similar process was at work, although the conditions were very different. When the Dutch colony of the Cape of Good Hope was annexed to Britain at the close of the Napoleonic Wars there was already a considerable white population of Boer farmers, who as they trekked inland in their ox-waggons were resisted by tribes of Bantus, who at that same time were moving south from the African interior. British settlers established themselves at the Cape and in Natal, while the Boers set up republics in the Transvaal and on the Orange River over which Britain exercised only a vague suzerainty.

Cape Colony was granted responsible government in 1872 and Natal some years later, but the republics remained aloof. It was not until 1909, after the South African War of 1899-1902, that the colonies and the republics united to form the Union of South Africa. High hopes were entertained for this fusion of races and cultures in a political experiment, but unfortunately these were destined to be frustrated.

When Queen Victoria died in 1901 the war in South Africa was drawing to its end, and the British Empire was at the height of its greatness. A very large part of the map of the world was coloured a British red, and the expansion continued right up to the period of the First World War, particularly in Africa, where Cecil Rhodes's

vision of British rule extending from the Cape to Cairo seemed well on the way to fulfilment. The war strained the imperial edifice, but it weathered the storm, and the British Empire now covered a fifth of the globe and included a population of approaching five hundred millions of every race and creed and of every stage of political, economic and social development.

From time to time Imperial Conferences were held in London under the presidency of the British Prime Minister, and the Conference of 1930 prepared a new formula defining the relationship of the great Dominions with Britain, that in the following year was enacted as the Statute of Westminster. The preamble to the Statute included the words, "Inasmuch as the Crown is the symbol of the free association of the members of the British Commonwealth of Nations, and as they are united by a common allegiance to the Crown . . .", and the Act went on to state that the Dominions (Canada, Australia, New Zealand, and South Africa) "are autonomous Communities within the British Empire, equal in status, in no way subordinate one to another in any aspect of their domestic or external affairs, though united by a common allegiance to the Crown, and freely associated as members of the British Commonwealth of Nations".

By a process of peaceful change, the British Empire gave place to a British Commonwealth of Nations, comprising a great number of lands and peoples at various stages of political development, but the largest components already enjoying independence and others well on the way to achieving it. The Second World War speeded up the process, and when it was over there were many alterations in the Commonwealth fabric. India, divided into the two countries of India and Pakistan, was granted independence in 1947, and Ceylon in the following year similarly became a self-governing dominion. The states in Malaya were federated in 1957 as an independent country within the Commonwealth. Within the next few years Nigeria, Ghana, Kenya and Tanganyika, Uganda, Sierra Leone, and several more of the former colonies achieved independent nationhood within the Commonwealth. A notable exception was the Union of South Africa, which in 1961 became a republic and withdrew altogether from the Commonwealth.

At the present time the area of the British Commonwealth is estimated to be about fourteen million square miles, and its total population is about 750 millions. It is the largest and most comprehensive, and most extraordinary, political complex the world has ever seen, and it is still developing, still changing, still growing.

While its heart is still the British Isles, and most of its members acknowledge in some way the supremacy of the British Crown, the great majority of its people have black, brown or yellow skins, and profess other religions than Christianity and speak many other tongues than English.

If one of the statesmen of Lord Durham's generation could see what the Empire had become he would rub his eyes in wonder and find it hard to believe that he was actually seeing what he did see. Impossible that such a motley collection of states and peoples should hang together, he would surmise. And yet it does. The British Commonwealth exists, and it works, and it has a future of boundless promise.

And none of this modern development would have been possible if British statesmen had taken a different road a hundred years ago. To speak more particularly, none of it would have come about if Lord Durham in 1838 had not argued so convincingly in favour of the grant of responsible government to the constituent members of the British family. As he lay dying, this man who had done more than any man to save the Second British Empire, was heard to murmur, "Canada will one day do justice to my memory." He was right, but not only Canada should do justice to his memory but the whole British Commonwealth of Nations, for (it is not too much to say) but for his Report it could have never been.

## *Invention of the Camera*

### *The Birth of Photographs, Moving Pictures and Television*

LATE IN 1962, American aircraft, flying at heights so great they were invisible from the earth, took photographs of Cuba. To the human eye, from this height, there would be no detail—only the flat brown silhouette of an island against the sea, the gaps, the bulges, of its coastline.

But a few minutes later, when these photographs were developed, they proved beyond all doubt the existence of what, till now, had been only an ugly rumour. Item by item, hour by hour, the Soviet Union had been building a network of rocket bases aimed at the heart of America. Some were complete, a few were still being built. All were sited to fire north-west, into the centre of the continent—and all of them were within a few hundred miles of their target.

The crisis that followed, the way in which it was resolved—all this is history. But if the most startling advances had not been made in the science of photography during the century and a quarter since it began, the bases would never have been detected, with consequences at which we can only guess.

How can a camera reveal so much more than is apparent to the eye? It has two main advantages. Firstly, the camera, seeing through a powerful, long-range lens (though our eyes could see almost as well, aided by such a lens), has its built-in memory. Our eyes, looking earthward through a powerful lens from eighty thousand feet, may see a rocket installation—but the impression has gone in an instant, the light changes, the aircraft flies on. With its image preserved on film, the installation can be studied at leisure, compared with a hundred other pictures, earlier ones, pictures taken at different times of day, from different angles. They can be magnified again, under a glass.

A second advantage possessed by the camera is that it can use film and filters designed to secure an image by the action, not of ordinary light rays, affected as they are by haze and cloud, but of infra-red rays, present in sunlight and invisible to the human eye.

Unaffected by cloud, the infra-red rays yield a picture in conditions where visibility hardly exists.

This is what we do now. How did it start? How far have we come?

Photography is generally reckoned to have begun with Daguerre in 1839; he was the first man to make it practicable as well as possible. From the announcement, in August of that year, of his success, his "daguerrotype" was supreme for twelve years. This was photography, and the world flocked to Monsieur Daguerre's studio.

But the world's first photo had been taken thirteen years before, by Daguerre's compatriot, Niepce. It is a view from his window and, though it is blurred and faint, we can clearly make out a tree, a courtyard, a pigeon-roost. The principle by which it was taken, by which photos are still taken—that sunlight turns certain salts of silver black—had been noticed centuries before. Whether it was the heat or the light that did it, no one knew, but it happened. No one considered a possible application of the phenomenon. Then in 1727, in Germany, Johann Schulze proved that the effect was caused by light. He succeeded in transferring the outline of stencilled letters, in sunlight, on to a white mixture of chalk grains and nitrate of silver, rather like a birthday message on a cake. The grains went dark where the light reached, stayed white where it did not. In front of a fire, nothing happened; heat could have nothing to do with it.

There was no way of retaining Schulze's impression. As soon as it was studied under ordinary light, all the grains went black.

Nothing further was done for a hundred years. Then Niepce discovered, while he experimented with new methods of printing, that an image cast by a "camera obscura" (literally a "dark room", often an attic room, with a lens in its roof which could throw a startling image of the outside scene on to a white cloth) would leave an impression on a metal plate covered with a special bitumen. The bitumen bleached easily in strong light and Niepce discovered the more important fact that it hardened as well. The soft bits, which had been less exposed to light, he could wash off, leaving a rough image. He made several copies of etchings, oiling them so they were transparent and placing them, in strong sunlight, over his coated plate. Then he made his first picture from nature, using the camera obscura. The exposure lasted eight hours (we can see the sun on both sides of the sky) but the picture was recognizable.

Meanwhile, Louis Daguerre was working on similar lines and in 1829 when he heard of Niepce's discovery he invited him to



join him. It was not for eight years, by which time Niepce had died, that their collaboration bore fruit in the form of a first "daguerrotype". It required only twenty minutes, as against eight hours, and gave a much more detailed picture. Daguerre had been an artist and this first daguerrotype is an attractive, well-composed still life—a seashell, two cupids' heads, a painting, a wine flask. Two years later he made his first picture of a living subject and published the details. He had reverted from Niepce's bitumen to salts of silver and had discovered that a very short exposure which had no noticeable effect on the photographic plate could be miraculously "developed" so that the picture was clear. He also found a chemical means of "fixing" the image, so that further exposure to light did not darken the whole of the plate.

From this date photography began, and Daguerre, perhaps not quite justly, has the credit. We do not know how much work was done by Niepce, but do know that in England, Fox Talbot had been working on a different process and had made a clear picture of his workshop window—but not of what was visible through it—as early as 1835, and on paper. As Talbot's method improved and his "Talbotypes" became popular, his pictures began to supplant Daguerre's. For one thing the picture, on paper, was cheaper to produce than one on a metal plate, and copies could be made of it, on to other pieces of paper, whereas a daguerrotype was the only one of its kind, a singleton; the "positive" image, black being black and white being white, was formed in the camera, and the metal plate after removal, developing and fixing, was the picture.

With Talbot's method, the ancestor of the one we use to-day, a "negative" was formed in the camera—black was white; white was black—and from this an infinite number of positives (in effect, photographs of that negative) could be easily, cheaply, made.

Photography, like so many others, is a compound discovery. The Science Museum in London lists the Fathers of Photography as "Niepce, Daguerre, Fox Talbot, Sir John Herschel, J. B. Reade, F. Scott Archer, R. L. Maddox," and each of these played a part. A name not listed, but whose owner made a discovery which put photography among the amateurs, and thus enormously multiplied the brains, the hands working on its development, was the American, George Eastman (of "Kodak" fame), who in 1884 put on the market the first roll-film. This was usable by any novice, though it still had to be loaded into the camera in complete darkness. Seven years later he followed up with a "daylight-loading" film, and from now on photography was a household word, every family's plaything.

The camera—both its name and its design are taken from the “camera obscura” which gave such innocent amusement to our ancestors—is simply a light-tight box with a lens at one end, a place for film at the other and a shutter in between. For simple photography, even the lens is unnecessary; a child can make a workable “pin-hole camera” by punching a tiny hole where more sophisticated equipment would demand a lens.

For anything beyond a toy lenses are required, and these apparently simple pieces of glass are the most expensive items in photography. A simple lens—one piece of glass—has many faults, varying from chromatic aberration in which the various colours of the spectrum are brought into focus at different distances, resulting in a blur, to astigmatism, which makes it impossible to focus at the same time both vertical and horizontal lines. Most faults can be rectified by using more than one lens or by making lenses of more than one glass (sometimes with as many as eight elements) and by careful “stopping down” of the lens so that light passes only through its centre.

Modern films, requiring exposure to light (a ten-thousandth of a second is quite feasible; Niepce used eight hours), have revolutionized photography. Rapidly moving objects (some, like rifle-bullets, moving too fast to be seen by eye) can be easily photographed. But with these rapid films we find we need, even in simple amateur photography, an “exposure-meter” and some sort of “range-finder”. To get a picture worthy of one’s film and one’s camera requires nowadays an accurate assessment of exposure—dependent on the light available, speed of film, size of lens—and an equally accurate measurement of the distance between lens and subject, in order that it be exactly “in focus”, and not blurred. With many modern cameras, these items—exposure-meter, range-finder—are built in, requiring no effort or thought on the part of the photographer; exposure, focus, set themselves, automatically.

Not long after the introduction of black-and-white photography, men began to experiment with colour. Although the process is more complicated, taking in effect three separate but simultaneous pictures with the three primary colours, red, blue and green, then combining them in one, it has reached a stage very near perfection, in still, as well as ciné, photography.

The cinema is an art and a science of its own, but it deserves a mention here. Within a few years of the first still photograph, at least one experimenter had considered what the effect might be if a series of rapid photographs were taken of, say, a horse galloping,

and then flicked past the eye, like a pack of cards, to simulate the horse's movement. It worked—and for the first time men realized that a horse did not gallop with all four legs outstretched. There is all the difference in the world between old etchings of horses on the move and more recent ones; the artist has seen the same thing, has interpreted it differently.

From the pack of photo cards it was a fairly short step to making a machine which would project the pictures, one after the other, on to a screen, sufficiently rapidly to give the impression of movement—and to make a complementary camera, which would take pictures at the same rate. When this had been satisfactorily performed, the next step was to take the pictures very rapidly and project them slowly. The result was "slow motion", which rapidly progressed from being a parlour joke to an essential tool of scientific research; the behaviour of a jet of liquid, the speed of a bullet, could be checked. And by reversing the process—taking pictures, say, every hour and projecting them far faster, we can see a flower bloom before our eyes.

The standard size of ciné film for professional purposes is thirty-five millimetres across, and the principal developments in still photography have tended to exploit this useful size. A 35-mm. camera can be small and yet hold a huge number of potential exposures. With developments in enlargement from a small negative, it is no longer necessary to make prints of the same size as the negative and for most work a 35-mm. negative, which can be "blown up" to any size, gives an entirely satisfactory result.

No doubt Daguerre, Fox Talbot, Niepce or any of the early pioneers would be startled to see where their toy has led. Not only do automatically operated cameras in aircraft and satellites take vertical or oblique pictures at predetermined intervals, to spy from the air, X-ray cameras take pictures through solids, infra-red cameras take pictures in the dark, ciné cameras take pictures that move. And, though, it is a distant cousin, but very definitely a blood relation, the television camera takes pictures and sends them, instantaneously, halfway round the world, bouncing them off satellites, pumping them along cables, getting the picture wherever it is needed or wanted, in less time than it would have taken Daguerre to open the shutter of his camera.

Where do we go from here?

## *Discovery of Anaesthesia*

### *Suffering is Relieved, and Surgery as we Know it Begins*

"THE MORNING of the operation arrived. There were no anaesthetics in those days, and I took no preparative stimulant or anodyne of any kind, unless two cups of tea, which with a fragment of toast formed my breakfast, be considered such.

"The operation was a more tedious one than some which involve much greater mutilation. It necessitated cutting through inflamed and morbidly sensitive parts, and could not be despatched by a few swift strokes of the knife. I do not suppose that it was more painful than the majority of severe surgical operations, but I am not, I believe, mistaken in thinking that it was not less painful, and this is all that I wish to contend for.

"Of the agony it occasioned, I will say nothing. Suffering so great as I underwent cannot be expressed in words, and thus, fortunately, cannot be recalled. The particular pangs are now forgotten, but the black whirlwind of emotion, the horror of great darkness, and the sense of desertion by God and man, bordering close upon despair, which swept through my mind and overwhelmed my heart, I can never forget, however gladly I would do so. Only the wish to save others some of my sufferings makes me deliberately recall and confess the anguish and humiliation of such a personal experience; nor can I find language more sober and familiar than that I have used, to express feelings which, happily for us all, are too rare as matters of general experience to have been shaped into household words.

"From all this anguish I should of course have been saved had I been rendered insensible by ether or chloroform, or otherwise, before submitting to the operation. On that point, however, I do not dwell, because it needs no proof and the testimony of the thousands who have been spared such experiences by the employment of chloroform is at hand to satisfy all who are not determined not to be satisfied.

"During the operation, in spite of the pain it occasioned, my senses were preternaturally acute, as I have been told they generally

are in patients in such circumstances. I watched all that the surgeon did, with a fascinated intensity. I still recall with unwelcome vividness the spreading out of the instruments; the twisting of the tourniquet; the first incision; the fingering of the sawed bone; the sponge pressed on the flap; the tying of the blood vessels; the stitching of the skin; and the bloody dismembered limb lying on the floor."

The letter—and this is but a small fraction—was addressed to James Young Simpson, discoverer of the anaesthetic power of chloroform. Apart from the poignant detail—every bit of which Simpson knew to be true—and its plea for a more widespread use of the drug, it contained a number of deliberately misleading clues to the writer's identity ("I belong to that large class, including most women, to whom cutting—is a source of suffering——"), and was signed, "An Old Patient". Simpson had no difficulty in recognizing the hand. George Wilson was a man who might easily, such was his brilliance, have become either a great physician or a great chemist—but while still a young man he had suffered a leg injury which called for amputation. He survived the operation, but in fact never regained his health. When he was offered the coveted Chair of Chemistry at Edinburgh University, he knew he must refuse. He did so and died—shortly after writing this letter. His name as the writer of one of the world's most famous "anonymous letters" lives on, and the letter is required reading for most students of anaesthesia.

Anaesthetics, for which Wilson pleaded so eloquently, have been in use for only a hundred years. From ancient times man had experimented with pain-killers, but none was remotely satisfactory for surgery; every sort of operation, whether for removal of tooth, gall-stone or limb, had to be performed with the patient fully sensible to pain. The search for a potion to deaden pain continued over the centuries; Homer mentions "nepenthe", which was probably hemp; the Romans took "mandragora" in their wine to dull the pain of wounds; and in later years people took opium from the poppy. Here is Shakespeare's Othello:

"Not poppy, nor mandragora,  
Nor all the drowsy syrups of the world,  
Shall ever medicine thee to that sweet sleep  
Which thou ow'dst yesterday."

In fact, neither poppy nor mandragora—nor wine—were found effective as anaesthetic agents. However drowsy the patient, the touch of a knife was sufficient to have him awake and screaming.

The first real anaesthetic—that is to say, a substance which actually made patients insensible to pain, whether or not it sent them to sleep—was discovered by Sir Humphry Davy in 1799. He is famous for discoveries in the fields of electricity and magnetism: forgotten for his service to anaesthesia. Nitrous oxide gas was reputed to be a deadly poison and Davy, in characteristic fashion, resolved to disprove this by inhaling it himself. He found that, far from killing him, it induced a wild, uncontrollable mirth, at the same time depriving him of sensation in his limbs. Immediately he dubbed it “Laughing Gas”, and as it seemed to him “capable of destroying physical pain”, he wrote that it could “probably be used with advantage during surgical operations”.

No one listened. It was half a century later, in 1844, when a young American dentist, Horace Wells, wandered into a demonstration being given in Hartford, Connecticut, by a “Professor” Colton. Colton was a failed medical student who made a living by touring the country giving demonstrations of popular science. This particular demonstration of “Effects Produced by Inhaling Exhilarating or Laughing Gas” was a firm favourite. The lecturer handed round bladders of the gas, inviting selected members of the audience—but only “Gentlemen of the First Respectability”—to sniff it. One of his Gentlemen ran so wildly round the auditorium, cannoning off wooden benches and the wall, that when Wells, fascinated, took him aside, asked if his bruises hurt, the man said, “What bruises?” He had now recovered from the “exhilarating” effect; he was shocked at being shown them.

It immediately struck Wells that this was something a dentist could use. He invited “Professor” Colton to his surgery the next day to provide his gas, while he, Wells, had an uncomfortable wisdom tooth removed by a colleague.

The operation was painless and a complete success, and Wells’s remark, when he opened his eyes after this first effective administration of anaesthetic, the discovery that was to revolutionize surgery and medicine, was a masterpiece of unwitting understatement.

“Ohhh—”, he gasped. “A new era in tooth pulling!”

Unfortunately, Wells’s own public demonstration of the gas failed miserably: the bladder was removed too soon, and the patient, waking up, roared that he was in agony. Wells was booed from the auditorium with shouts of “Humbug!” and died a few years later, in poverty. His partner, William Morton, was able to go on with the work and he now tried a new substance, sulphuric ether. This had been remarked as early as 1818, by Faraday, as having similar

properties to nitrous oxide. Unlike "Laughing Gas", ether was a volatile liquid and could therefore be administered by soaking a handkerchief in it, holding it against the nose. It had a stronger power of anaesthesia than its predecessor, from which patients were likely to recover consciousness during particularly painful surgery. It seemed possible that even amputations could be painless, under ether.

Morton arranged to anaesthetize a patient at the Massachusetts General Hospital, being operated on for removal of a tumour in the neck. Unfortunately, he was having difficulty with his new ether "dispenser", and he arrived fifteen minutes late, to find surgeon, patient and audience distinctly hostile. Breathlessly, he set up the machine beside the operating table, while the surgeon hummed, tapped his foot. At last, with a reassuring word Morton held his mask over the patient's face.

After five minutes he seemed in a deep sleep. Morton nodded: the surgeon made an incision.

There was a gasp from the audience. This was the point at which the air, in all surgery, was rent with screams. Instead, there had been silence, not a move.

The operation was entirely successful, completely painless. The date—16 October, 1846.

It is interesting to note that both nitrous oxide and ether were noticed by Englishmen at the turn of the century, were rejected by surgeons and rediscovered, fifty years later, by American dentists.

In 1847, a year after the ether demonstration, James Young Simpson, Professor of Midwifery at Edinburgh University, first used chloroform. This, like ether, was a volatile liquid, but more powerful in its effect; only a few drops on a cloth were needed to produce deep anaesthesia, sufficient even for abdominal operations, where the patient, while still being unconscious, might contract powerful abdominal muscles at the first incision, making further surgery impossible. It had a pleasant smell; there was none of the irritant effect on lungs for which ether was becoming unpopular; and it was uninflamable. So great were its apparent advantages that it almost completely superseded the earlier two anaesthetics.

Then, quite suddenly, it was found to have severe disadvantages. As suddenly as it had risen to fame, it dropped to unimportance. It was too easy, surgeons found, to give an overdose—and this injured both heart and liver. Its most tragic property—not quite understood, even to-day—lay in its tendency to cause sudden death early in its administration. Young, healthy patients, anaesthetized

for some trifling surgery, died suddenly within a minute of its commencement, of heart failure.

There remain conditions where chloroform is still the best anaesthetic, and in the hands of an expert it is safe.

In the year Simpson first used chloroform, the anaesthetic property of yet another substance was noted: ethyl chloride. It was 1896 before it was used in surgery. Rapid and safe, but like chloroform requiring an expert, ethyl chloride is used a great deal for children's operations—the tonsils, adenoids of childhood.

In 1929 cyclopropane was developed. It is extremely powerful and so little of it is required that a patient—particularly one suffering from a lung ailment—can be given an anaesthetic mixture which is almost entirely oxygen. This gas is extremely expensive and—rather unnervingly—explosive, so that a special “closed-circuit” machine is required to deliver it to the patient, a machine which allows him to go on breathing a proportion of his exhaled air.

During the Second World War yet another inhalant anaesthetic was developed, trichlorethylene, and this has proved the ideal for a number of types of cases.

All these “inhalants” make use of the body's capacity for absorbing substances through the lungs into the blood-stream, whence they travel to the brain. It soon became apparent that a more direct method would be to inject the substance straight into a vein. This, when a suitable drug was found, proved highly effective. The first to be used was hexobarbitone, in 1932, and since then many similar drugs have been developed. They are far less alarming to the patient; there is no sensation of breathlessness, no choking; a prick with a needle is all. Often, for prolonged surgery, the intravenous drug is followed by an inhalant. The disadvantage of intravenous anaesthetics—the chief reason they are seldom, in major surgery, used alone—is that an overdose, once given, is almost impossible to rectify: there is no mask that can be whipped away from the patient's face; the drug is in and away.

A common intravenous anaesthetic is thiopentone, which has achieved some fame—or notoriety—when given in small doses, as a “truth drug”.

A different, local form of anaesthesia can be obtained with the injection under the skin of certain drugs with an action on nerve tissue. They deaden sensation in the part injected, and have no effect on consciousness. The first to be used—and now almost entirely supplanted, though the name is a popular one—was cocaine, brewed first in 1884 from the leaves of the Peruvian coca plant. Probably



the most used at present is procaine. All local anaesthetics achieve a "nerve block", preventing the nerves around the area sending back messages to the brain.

A specialized form is spinal anaesthesia, in which a number of nerves, all those supplying a part of the body, can be temporarily blocked by injecting the drug into a point along the spinal column. The body's nerves are linked to the spinal column, joining it in clusters the whole way along its length, and an anaesthetic into the right cluster will immobilize anything up to half of the body—without affecting consciousness. It was discovered by accident in 1885 when the New York neurologist Leonard Corning punctured the surrounding wall of a dog's spinal column, during an experiment on anaesthetizing a nerve in the back, and found that he had anaesthetized a large part of the dog.

New anaesthetics, new techniques, are constantly being developed. A recent addition to surgery, which though not technically an anaesthetic at all, deserves mention is curare. This, a poison used by South American Indians to tip their arrows, is now used extensively to relax muscles. Once a patient's muscles are relaxed, guaranteed to stay that way through the operation, an anaesthetist requires only sufficient "gas" to keep him unconscious. This makes for greater safety.

But probably no modern development in anaesthesia is likely to equal the breakthrough that took place on the day in 1846 when Horace Wells woke without his wisdom tooth, gasped and said, "Ohhh— A new era in tooth pulling!"

## *The Ten-Hours' Day*

### *A Break-through in Factory Legislation*

LORD ASHLEY was very surprised when he received the invitation to put the factory workers' case before parliament. Very likely he had never met a factory "hand" in his life, and he had certainly never been inside a factory, and knew no more of what went on inside those places than what he had been able to learn from reading the newspapers. "Whatever can have been the reason", he must have thought, "that has made them pick on *me*. . . ."

If he had been better acquainted with what had been going on in the manufacturing districts of Lancashire and Yorkshire he would have had less cause for wonder. For thirty years the factory workers had been agitating for a reduction in their tremendously long hours of work—twelve hours a day was quite usual and fourteen not at all uncommon, and when the order-books were full the machines were kept going all through the night, with the attendant hands working in shifts.

In 1802 a Factory Act had been passed that had brought some slight benefit to the most oppressed class of the factory population—the child apprentices who were as good as sold by the workhouse authorities to the millowners of the northern districts. This had been followed in 1819 by another Act for which Robert Owen had been largely responsible (see "The Vision of Robert Owen"), which had likewise been intended to alleviate the conditions under which the children worked in the factories. In practice, however, it had proved most disappointing, and in 1832—the year of the passing of the great Reform Bill—there were many thousands of children working in the textile mills, all of whom were entirely unprotected by legislation except those employed in cotton mills, and in those mills little children, boys and girls, of nine years of age could be made to work—and did actually work—twelve hours a day.

Still the agitation continued, and at length in 1831 it had reached such a pitch that the factory workers were filled with a fresh hope. Towards the end of that year another Bill was introduced into the House of Commons that would prohibit the employment of

children under nine years of age, and limit the hours of work of all between nine and eighteen to ten hours a day. The second reading of this Ten Hours' Bill, as it was called, was moved in March, 1832, by Michael Sadler, a staunch Churchman and strong Tory, who had a linen business in Leeds and had become horrified by the conditions under which he found children working. Sadler's speech had made a deep impression on the House, particularly when, to illustrate his description of the savage beatings inflicted on boys and girls to keep them awake and attentive to their work, "the honourable member", as the parliamentary report puts it, "exhibited some black, heavy, leathern thongs . . . the smack of which, when struck upon the table, resounded through the House".

All the same, the House had not passed the Bill as it stood, but had set up a Select Committee to inquire into the conditions of Factory Children's Labour. All through the summer of 1831 this Committee had sat under Sadler's chairmanship, and in August he laid before the House a mass of evidence that shocked everyone who read it. Certainly it had shocked Lord Ashley, as he read the reports given in column after column of *The Times*. Such dreadful stuff it was; the most terrible descriptions of callous cruelty inflicted on defenceless children, many of them not yet in their teens, merciless beatings with sticks and straps, sadistic punishments for the slightest faults of clumsiness or inattention, boys and girls and young people bullied and cursed and tormented, knocked about and pushed around by those placed in authority over them.

Yes, Ashley had been horrified and disgusted, hardly able to credit that such abominable things were being done in Christian England. This sort of thing cannot be allowed to continue, he must have thought to himself, and he would have liked to give a hand in the good work. He wrote to Sadler offering his services in such small matters as presenting petitions, etc., but he had received no answer, and had given no further thought to the matter. And now there had suddenly descended upon him this representative of the factory workers—what was his name? Bull . . . the Rev. G. S. Bull, vicar of a parish just outside Bradford . . . he had never heard the man's name before—bearing an invitation that he should become their spokesman in parliament! Really it was most extraordinary, and in his diary he noted that he had received the invitation with "astonishment, and doubt, and terror".

What had led up to the invitation was this. Sadler was no longer available: at the general election that had followed the passing of the Reform Bill in 1832 he had stood for Leeds, and notwithstanding

the vociferous support of the factory population—who, however, had no votes—he was defeated. The leaders of the factory workers had to look round for another spokesman, and they found it difficult enough. Some of them would have preferred Cobbett, the doughty Radical journalist who had been elected for Oldham, but he was getting old and besides had the reputation of being the most quarrelsome man in England; others suggested John Fielden, but although his devotion to the cause of factory reform was undoubted he was himself a great manufacturer. Then there was Robert Owen—but he had never sat in parliament, and moreover he was no longer interested in factory legislation but was busy starting Utopian schemes of one kind or another. Who then? Someone came up with Lord Ashley's name: he had heard that his Lordship was very interested in social questions and had particularly distinguished himself in endeavouring to improve the conditions in lunatic asylums. Might not he be induced to take up factory legislation? And that is how it came about that "Parson Bull", as he was styled—and though he was a clergyman he was one of the most wholehearted supporters of the factory agitation—came to make his appearance on Lord Ashley's doorstep in London.

When Ashley had collected his thoughts, he asked if he might have some time to consider the proposal. No, rejoined Mr Bull, the matter was extremely urgent, since they had reason to believe that unless they got in first with a Ten-Hours' Bill, the Government would produce one of their own providing for a working day or eleven hours. At last Ashley was able to persuade his visitor to come back in the morning, when he would have his reply ready. As soon as the door had shut behind him, Ashley hurried round to one or two of his most intimate friends, and asked their advice. To his surprise they all urged him to accept the offer: seemingly they knew his capacities better than he did himself.

Returned home, he went to put the matter before his "dear Min", the young and beautiful lady—an aristocrat by birth like himself, and like himself most ardently interested in "good works"—who was his wife. Frankly and freely he put the matter before her, and he was not afraid of using the darkest colours. Think what it would mean, he said, to her as well as to him: the sacrifice of leisure, being cold-shouldered by friends who took the opposite view, perpetual worry and anxiety, constant work, running here and there about the country, mixing with people of a very different type from those they had been accustomed to, many of them of the most unpleasant character. . . . Lady Ashley listened; and then

when he had finished pronounced the verdict. "It is your duty," she said, "and the consequences we must leave. Go forward, and to Victory!"

When Mr Bull called the next morning, Lord Ashley gave him his answer: Yes. Hurrying back to his hotel, the parson wrote letters to the "Short-Time Committees" in the north who had entrusted him with his mission. Lord Ashley, he wrote, had already given notice in the House of his intention to reintroduce Mr Sadler's Bill, "to regulate the labour of children in the mills and factories of the United Kingdom", and the announcement had been received with hearty cheers. "As to Lord Ashley, he is noble, benevolent, and resolute in mind, as he is manly in person."

At that time Ashley was in his early thirties. Anthony Ashley Cooper, to give him his full name, was born in 1801, and he lived until 1885. He was the eldest son and heir of the Earl of Shaftesbury, and he succeeded to the title as the 7th Earl in 1851 on his father's death: in the histories he is usually referred to as Lord Shaftesbury, but it was as Lord Ashley that he did his most important work as a humanitarian legislator. He entered Parliament in 1826 as Tory Member for one of the "pocket boroughs", and soon gained the reputation of being a competent, zealous and altogether honest back-bencher. He was most deeply religious, an Evangelical of Evangelicals, and he valued nothing so much as his conscience. This sometimes made things decidedly uncomfortable for him, and for others, since he could never be relied upon to follow the strict party line.

Born an aristocrat, he was never a popular figure in the pleasure-loving circles of his class and order. He had powerful relations and friends, who would have been delighted to give him an occasional shove up the political ladder, but that conscience of his would keep on leading him along unpopular by-ways. Sometimes he was accused of being narrow-minded, priggish and a bit of a humbug. Another complaint about him was that he kept the strangest company: he had not much liking for official receptions and dinners and parties, but seemed to prefer hobnobbing with people of the poorer classes, and mixed on easy terms of friendly condescension with crossing-sweepers and waifs and strays of the London streets.

This, then, was the man whom the factory workers had enlisted as their champion, and they soon realized that they had no reason to regret their choice. He made it an invariable rule never to take anything on trust or hearsay, but to see everything with his own eyes. As soon as he had accepted the mill-workers' invitation, he

went to the manufacturing districts and examined the mills, the machinery, the homes of the people, and watched the "hands" at their work. This, he declared years later, "gave me a power I could not otherwise have had. I could speak of things from actual experience, and I used often to hear things from the poor sufferers themselves, which were invaluable to me. I got to know their habits of thought and action, and their actual wants. I sat and had tea and talk with them hundreds of times."

When Ashley reintroduced Sadler's Bill into the House of Commons in March, 1833, the prospects seemed bright. But before long the employers rallied their friends, and it was decided to appoint a Royal Commission "to collect information in the manufacturing districts with respect to the employment of children in factories, and to devise the best means for the curtailment of their labour". Ashley was wrathful, and the factory workers protested most strongly—almost riotously—against something which they looked upon as nothing more than an attempt to postpone the very necessary reforms. When the Commissioners appointed visited the factory districts they were often given an exceedingly warm reception.

But when the Commission reported on its findings, it was found that the case for reform had been largely admitted. The government proceeded to introduce a Bill of their own, and this was passed into law as the Factory Act of 1833. It did not go anything like so far as the factory workers wished, but all the same it was a very great improvement on what had gone before. In the first place, it applied to nearly all textile mills, whereas the earlier Acts had applied to cotton mills only. Then it excluded children under nine from factory employment altogether. While as regards hours of work, it limited those of children under thirteen to forty-eight a week, and those of young persons from thirteen to eighteen to sixty-nine.

Preposterously long as these hours must seem to us, at the time they were thought to constitute an extraordinary invasion on the rights of an employer to employ his "hands" as long as he liked. There was another clause in the Act that was to prove of even greater importance, the one which provided for the appointment of four full-time Inspectors to see that the provisions of the Act were complied with. For the first time factory inspection became a reality.

The Act of 1833 represented a compromise. Ashley accepted it as such, but some of the workers' leaders were highly critical of his part in the affair. What they wanted was not a mere reduction in

the hours of children's labour but the establishment of a ten hours' day for *all* workers, and this seemed as far off as ever. At length an Act was passed in 1847 that limited the hours of working of young persons and women in factories to ten a day, which meant in effect that the hours of the men who worked beside them were similarly limited. By a stroke of bad luck Ashley was out of the House of Commons when this victory was won. He had resigned his seat because he supported the Prime Minister, Sir Robert Peel, in his conversion to a policy of Free Trade, and the constituency he then represented was strongly protectionist. He was returned before long for another constituency, but in the meantime the Ten Hours' Bill had been carried under the leadership of John Fielden.

This was not the end of his efforts on behalf of the factory workers, however—far from it. The new Act had soon to be amended, and it was Ashley who had charge of the amending Bills. Then in 1840 he had extended his operations to the condition of the children, and later the women, employed underground in coal mines. At his instigation a Commission was set up, which in 1842 produced a report that shocked the nation with its revelations of little children employed as "trappers" for twelve hours a day, children of seven years of age and even younger, and of women and girls who were made to labour dragging the coal-tubs in a state of near nakedness among miners who in many cases were completely naked. The speeches in which he exposed these shocking barbarities were among the finest, the most powerful, that he ever made, and had a tremendous effect. He had the satisfaction of obtaining the prohibition of female labour underground, and of the employment in the mines of children under ten years of age.

This was, perhaps, his greatest triumph, but there were many other fields of philanthropic endeavour in which he exerted himself to good purpose. His long struggle to secure the prohibition of little boys engaged in sweeping chimneys calls for the most honourable mention, but he was equally successful in his establishment of Ragged Schools in which the outcast children of London and other great cities were rescued from squalor and infamy and given a fair start in life, the improvement of the housing conditions of the workers, and an altogether fresh and more human approach to the treatment of the mentally afflicted.

But when all is said of these many activities in which he toiled so long and with such disinterested devotion, it remains true that it was in the field of Factory Legislation that he made his most permanent and beneficial mark. As J. L. and Barbara Hammond wrote

of him: "He did more than any single man, or any single Government in English history, to check the raw power of the new industrial system," since the chief credit for our system of Factory Law "must be given to his courage, his humanity, and his patience". And it all stemmed from the invitation that was brought him by Parson Bull, the invitation that had filled him at first with "astorishment and doubt and terror", but had provided him with a challenge that had aroused all his latent gifts of mind and body and spiritual power.



## *The Year of the Revolutions*

### *Europe Moves Towards Popular Freedom*

THE ATTEMPTED despotism of Charles I of England had not appealed to his subjects and they had decided to have none of it. Though in 1649 it never occurred to the people of England that here, as in so many aspects of the relationship of the individual to national life, they were pioneering, it was precisely what they were doing.

That a people could execute its monarch shocked Europe; and although it might be difficult to prove that England's example of regicide was a factor in delaying the revolt against despotism elsewhere, when they could stand the tyrant's trampling of individual liberty no longer, the French at least found it a useful precedent a century and a half later, and it was they who, henceforward, were to take over the mantle of revolt-leadership against monarchical absolutism.

The great French Revolution of 1789 differed from the English revolution of 1642 in many of its aspects and particularly in its aftermath. This was due to the fact that for four centuries before their uprising the English had been developing and consolidating a powerful instrument for the expression of the popular will; and to the fact that the strongest component of this instrument, the House of Commons, was comprised of a category of Englishman who had no true counterpart anywhere else. They came of a solid middle class composed of smaller landowners, gentlemen farmers and merchants who could lay no claim to being magnates, but who, nevertheless, could collectively wield a power equal to, and often exceeding, that of the magnates. It was these men, solid, stolid, calm in their ruthlessness—the Cromwells, the Fairfaxes, the Wallers—who, with one or two sympathetic lords, led the revolt in 1642.

It was parliament against the king, not the mob against the king; and when the King was at length defeated and rendered permanently harmless, it was the instrument of government which took up the reins of government, and the same processes which had operated before continued to operate.

In France there was no institution comparable with the English parliament. There it was the mob against not only the king, but the petty despots of the aristocracy as well; and when the despots had been eliminated, France had no instrument of government which could take their place. And because there was no tradition of administration which by any stretch of the imagination could meet the new circumstances, the results were inevitably chaotic, and produced just the right atmosphere and conditions for the generation of a new despotism imposed by a man strong enough to inject the chaos with order by the force of his outstanding genius.

But when the imperial Napoleon overreached himself in the furtherance of his country's aggrandizement, which was secondary to his own personal ambition, he left France once more resting on shaking foundations of government. By the decision of the European powers who had resisted the Napoleonic hegemony of Europe, she was provided once more with the spectacle of a king and a Court. But the old régime had gone for ever. The Codes and the Napoleonic University, which had operated to produce a society which was more egalitarian than one might have expected to emerge from despotic rule, had grafted on to them a restored monarchy that was absolutist and clerical by tradition, yet a monarchy which, it was intended by the restorers, should be constitutional in its nature.

The position of Louis XVIII, viewed from any angle, was a very difficult one, and did not improve as the years passed. Though he weathered it by his pleasant, easy-going approach to his trials for close on a decade, his successor Charles X was much more autocratic by nature and desire. "I would rather chop wood than rule after the fashion of the King of England," Charles declared at the beginning of his reign, and shutting his ears to the demands of the future he harked back to the old régime, with the result that soon both king and people were planning action, each according to his lights.

The king struck first. On 25 July, 1830, he issued ordinances limiting the freedom of the Press, dissolving the Chambers and changing the electoral laws. But he had counted without the people of Paris, who responded sharply, and after three days of fighting drove the king from his throne.

The régime which followed was one which might have appeared in England, but nowhere else. It was neither a republic nor an empire but a bourgeois monarchy. Louis Philippe was a man of the new world, simple and homely in his ways, and, so it seemed, just the man to lay the foundations of a democratic state. During his eighteen years' rule, his prudence, experience and hard work allowed

France to transform herself into a prosperous trading nation. But to the logical Frenchman, despite the benefits undoubtedly bestowed upon them by it, a monarchy which was not a true monarchy, nor yet an empire, nor a republic, represented a fundamental flaw in the régime, and the kind bourgeois king, whose hall-mark was an obtrusive domestic virtue, the ordinary citizen found to be a crashing bore.

These factors undoubtedly played a part in his ultimate downfall, but the more serious reasons were similar to those before which the British Government had bowed in 1832, when the first Reform Bill had been passed. While England was advancing rapidly, under the influence of this Bill, along the path of liberal legislation, Louis Philippe's chief minister Guizot firmly resisted all, even the most moderate, demands for an extension of the franchise, which was still far more restrictive than the British one which had provoked similar demands in England. Guizot's policy from 1840 to 1848 was one of flat negation, and it could only end in disaster.

Despite the confusion which attended the development of the First Republic in the immediate post-Revolution period, the philosophy on which it had been based was egalitarian in its concept of the political and personal rights of the individual. But though the Revolution had set men free from the bondage of privilege, what developed was not Socialism, however one might look at it. The problem of poverty was still as formidable as ever it had been and was no nearer solution.

Now, however, men began to consider it more closely, and the question that presented itself was whether or not it would be possible to reorganize society so that fairer shares all round might eliminate poverty. The basic principle accepted, there began to emerge almost as many ideas on how it could be effected as there were articulate Socialist-inclined men, and one result of all the writing and the talk was that among the lower strata of Paris society there began to spread a notion that an imminent upheaval would make it possible for "the valet to drink his master's wine, and the femme de chambre to put on her mistress's finery". This was not the Fabian concept of the transformation of society, but one of violent political revolt.

Once more it was in the capital that the revolt came. On 23 February, 1848, the barricades went up and behind them surged a violent mob, clamouring for *La République*. Losing his nerve, the old, tired king abdicated in favour of his grandson and fled to Surrey. The demands of the mob were excessive, but the assembly gave way on one point—universal suffrage; and when all the

excitement and violence were over the Republic which emerged had a President and a single Chamber elected on this principle. Though the Republic lasted only three years, the great movement of the human spirit which was to characterize Europe for the remainder of the century and after had been set in irresistible motion in France.

The February Revolution of 1848 had the look of being the touch-paper for a series of popular revolts which were to break out all over Europe within the next few months. In the spring, for example, the smouldering tinder of uprising burst into flames in Italy. Here, instead of being concentrated in one city, it touched most of the larger centres, Rome, Turin, Leghorn, Pisa, Florence and Milan.

It was fanned into activity primarily by the desire of the people to possess those elementary political and civil liberties obtained by the English and now accorded to the French. The restrictive *modus vivendi* to which the Italians were subjected—police espionage, arbitrary imprisonment, censorship of newspapers and books, restrictions on travel—had given rise to a widespread discontent with the form of despotic government under which they lived, split up among the kingdoms and autonomous dukedoms of the Italy before the days of unity.

Among the Italians, as among the inhabitants of Paris, there had come into being a notion that representative government would cure all ills. This belief affected rich and poor alike, but there were many differences of opinion as to how the common aim could best be achieved. This, added to the lack of cohesion which marked Italy, as it did contemporary Germany, rendered a concerted effort difficult; and it was probably this fragmented character of early-nineteenth-century Italy which differentiated the revolution here from that in France and elsewhere. While all might have their sights fixed on the same target, they lacked the deadliness of concerted fire.

The revolts of 1848 aimed for the most part, then, at remedying local grievances. Only in the north did larger aims emerge, and even there the rebellion had been in progress for some time before the leaders hit upon the idea of uniting *northern* Italy under the crown of Piedmont.<sup>1</sup> Nevertheless, almost everywhere certain limited gains towards constitutional government were made, and the rebellions of 1848 gave an impetus to the *Risorgimento*—the movement for national unity—which despite the collapse of the

<sup>1</sup> The belief that the Italian revolutions of 1848 aspired to national unity is a myth.

short-lived Republic of Rome set up by Mazzini and Gioberti in 1849, was not to be slowed down until union was achieved.

The 1848 revolt of Paris had an even more immediate response in Austria, where the Hapsburg dominions had, in 1835, fallen into the hands of a half-wit, whose incapacity had caused the government to drift into a state of inertia, finances into chaos and police control increasingly haphazard. Censorship also grew more lax, with the result that subversive literature was easy to come by.

Since 1815, Vienna had nearly doubled its population, mainly by an influx of impoverished peasants from the surrounding countryside who sought employment in the new textile and paper factories. The fact that employers preferred cheap labour and employed women and children rather than men, and that there were not enough jobs to go round, in conjunction with bad harvests in 1845 and 1846, had produced an overwhelming number of starving wretches who were prepared to follow anyone who promised them a fair deal.

Yet, when the news of the Paris Revolution reached Vienna, though these revengeful men and women provided the instrument of threat, every section of the population clamoured for action. In the face of disturbances, the decrepit monarch and court panicked. The one man who might have saved the situation for the old régime, the Chancellor, Metternich—he had been the most ardent resister of nationalism—was dismissed. This event was greeted with popular acclaim, but when it was rumoured that the emperor intended to turn the army on the city, the result was even more violent outbreaks of revolt, to quell which, on 15 March, Ferdinand granted freedom of speech, set up a council of ministers and promised a constitution.

Unfortunately, the feeble-minded Ferdinand, who was universally beloved, was unable to fulfil the promises he had made, and a fresh revolt was needed to secure the promulgation of the new constitution. On 15 May workers armed with shovels and forks flocked into the city to join the students, and confronting the administration they compelled it to agree to the election of a Parliament by universal suffrage. But the army were firm supporters of counter-revolution, and after a summer and autumn of internecine clashes the revolution and its complementary uprising in Hungary—the “other half” of the Empire—led by Kossuth, were brought to an end by superior force, with little to show for all the struggle, though once again the experience gained was to prove invaluable to the nationalists later on.

Though the Industrial Revolution had reached Germany later than it had begun to change the face and life of England, when it did begin it progressed at a rapid pace. In 1827, Alfred Krupp was already building his great industrial empire at Essen, and ten years later August Borsig founded his famous machine works in Berlin. Mechanization came most quickly to textiles and mines. But when the 1848 Revolution also took fire in Germany it cannot be said that the country was an industrial one, for three-quarters of her population of thirty-five millions still lived by agriculture.

However, it was among the factory workers, the best off of the working classes, that revolt started. Owner-profiteering, unhealthy and often degrading conditions of work—much the same causes which had prompted the demand for reform in England twenty years earlier—had given rise to a desire for a more liberal form of government. In this the workers were joined by the new class of businessmen who were beginning to consider themselves the élite of the nation, and who complained of the backwardness and prejudices of governments wedded to aristocracy and agriculture.

Much the same political situation obtained in Germany as existed in Italy. The unified Germany was still thirty years off, and the many petty autonomous states which formed the quasi confederacy—which the term "Germany" represented—again made concerted action impossible.

Albeit, when the news of the Paris revolt reached the country, widespread artisan riots broke out. In Westphalia and the Rhineland mills were fired and the houses of their owners stoned. In Nassau railway lines were torn up, while steamships on the Rhine were attacked, and in Baden peasant mobs stormed castles. This was the pattern all over Germany.

In their solitary weakness the princes bowed before the storm. Liberal ministers were appointed and elected assemblies were summoned. In Prussia, after the barricades had been raised in Berlin, King Frederick William was compelled to grant freedom of the Press, the formation of a liberal ministry and the summoning of a united assembly.

Presently the princes in concert undertook to call a central Pre-Parliament to draw up a constitution for all Germany. It meant well, but was ineffectual because it possessed no executive powers. Nevertheless, before it broke up, it had drawn up a list of civil liberties which were to become the foundation stone of the new Germany.

Taken all in all, the many revolutions which in 1848 disturbed the great countries of Europe—Great Britain and Russia proper

excepted—appeared at first sight to have been *vox et praeterea nihil* —“noise but nothing else”. In actual and immediate results this was true; but the new spirit among the masses which the new industrial era had engendered took root then, and was never to die, though it might periodically droop. Inevitably the natural rights of man were to exert an ever-increasing demand for recognition, and for this reason 1848 must be regarded as the true beginning of the individual freedom which the large proportion of mankind enjoys to-day.

## *Commodore Perry Opens Up Japan*

### *The Beginning of Japan's Rush from Backward Nation to World Power*

WHEN Queen Victoria assumed the imperial crown of India, still farther to the east, in an archipelago of islands known as Nippon, or the Land of the Rising Sun, a new phenomenon was about to emerge on the world scene.

Nippon, or Japan, as it was soon to become known, had been a secret land for many centuries. It had kept itself cut off from the rest of the world, except for a few Dutch traders and some Buddhist monks who brought their religion from Korea.

It had an emperor who was considered by his people to be a god, and people who considered themselves to be the children of the Sun-goddess. They believed that their country was the fairest on earth, since it had been created by the gods; and themselves to be the chosen people of the gods, since they had been put there to inhabit it.

In the middle of the nineteenth century they were still a feudal state. But though their emperor was their Grand Seigneur, they were ruled by self-appointed tenants-in-chief, called shoguns. Below the shoguns were the lesser orders of tenants, the daimio, or barons, and the samurai, or knights, the hereditary bearers of arms. Below them came the farmers, the merchants, the peasants and the serfs. Their economy was tied to the rice production.

They were not an inspired people. They had taken their language, their form of writing, their philosophy, even one of their religions, from the ancient civilization of China. They had been torn by civil wars for more than four hundred and fifty years, until, in 1600, the power was seized by a family called the Tokugawa, who, at the end of fifteen years of ridding themselves of their enemies, brought real peace at last to their country.

With peace, the Tokugawa shoguns reorganized the basis of their power, not on armed force, but by controlling the economy; by making the emperor even more of a recluse than he had ever been before, holding him completely incommunicado from all the



daimio; and by clipping the power of the daimio by various means.

Peace brought inevitable changes to the social structure of the country, for it had a direct effect on the rôle of the samurai, the fighting-men. Since the samurai were allowed to follow no other profession but arms, and since there was no longer any opportunity for practising their profession because of the restrictions laid upon the daimio, their employers, they found themselves with nothing to do. The shoguns, therefore, encouraged them to turn to scholarship, and this, in turn, gave rise to an intellectual class, destined to produce a highly refined and artistic civilization.

Under the Tokugawa, the merchants began to flourish as never before. Soon the wealth of the country began to flow into their hands, and strict sumptuary laws had to be introduced to control them. But these laws they managed to evade, even as they evaded paying their taxes.

These new developments could very easily have undermined the authority of the shogunate, and the Tokugawa shoguns realized this. Fearing most of all the conjunction of the internal changes with the few outside contacts they had, in 1639 the shogun closed Japan to all foreigners except the Chinese and the Dutch.

Now, while the peace which the Tokugawa shoguns brought to the country provided suitable conditions for the development of a national culture, the strict closure of Japan to all foreigners had a restricting influence on the general development of the nation. For at this time Western culture was bursting into full flower, and the exclusion of those European merchants who had just begun to take an interest in this strange country denied to Japan the inevitable influences which they would have brought with them.

Eventually the country ran into financial difficulties. Forced loans were levied on the merchants, and the coinage was debased, thereby creating inflation. The economy was soon completely undermined, and the sufferings this brought with it led to peasant uprisings.

In fact, everything was against the shoguns, and gradually a movement was created to end the exclusion of Western merchants, which was seen to be the cause not only of the economic disasters now falling on the nation but of the general retarding of the nation's medical, scientific, artistic and military resources. But even without this internal movement, outside factors and influences would ultimately have broken down the barriers.

In the late-eighteenth century the Russians were becoming more and more active on their Pacific seaboard and in Kamchatka, Sakhalin and the Kurile Islands. Then, Western trade with this part

of the world began to expand, making Japan's position even more anomalous, and her potential importance was further accentuated by the appearance of the steamship in the middle of the nineteenth century, with its need for bunkering facilities. But it was the Chinese defeat in the first Anglo-Chinese War which marked the beginning of a new phase.

The shoguns were impressed, and, though still determined to keep their country closed, in 1842 they did at least open up specific ports to foreign ships for taking on water and supplies.

The necessity for opening up Japan had been in the minds of the Americans ever since 1815, but it was not until 1846 that Commodore Biddle arrived in Edo Bay to attempt negotiations. The Japanese construed his politeness for weakness, and the Commodore's mission failed.

Then, on 8 July, 1853, Commodore Perry sailed into Edo Bay with a strong squadron. Going ashore with an impressive guard, he presented a letter from President Fillmore demanding trading rights, bunkering stations and protection for shipwrecked American sailors. Remaining with his squadron in the bay for a week so that the Japanese should have no doubts about American strength, he then sailed away, announcing that he would return in the spring of 1854 for an answer.

The American letter caused considerable consternation at the shogunate. So perturbed were the authorities that they sent a translation of it to each daimio, asking for opinions.

The daimio advice was that the demands should be resisted to the last degree, short of war. But when Perry returned in 1854, and made it quite clear that it was either a treaty or war, the Japanese yielded; and on 31 March the Treaty of Kanagawa was signed.

Once Japan was opened to trade, it could only be a matter of time before foreign cultural influences made themselves felt. This process was hastened by the willingness of young samurai to risk death for a chance of acquiring knowledge, for an edict of 1636 forbidding all Japanese to leave Japan was still in force. For when they could see and touch the products of civilization, the samurai were convinced of what they had already suspected themselves, from their study of foreign books, that there was much missing in their own country.

Within a short time the Americans, English and French had insisted on wider treaties. These, signed in 1858, granted to the United States, France and England the right to establish supply bases for their navies at Yokohama, Hakodate and Nagasaki.

Their signature was the sign for outbursts of anti-shogun and anti-foreign feelings, which were soon translated into actions. Those daimio who, secretly, had long been opposed to the Tokugawa shogunate, defied the shogun's orders and went direct to the immured emperor. Foreigners were attacked, and British and American officials assassinated. In 1863 the U.S. Legation in Edo was burned down.

In June of that year the shogun, who had been summoned to Kyoto by the emperor, was compelled to issue an imperial order to drive all the foreigners out of the country. One daimio, the Lord of Choshu, attempted to obey the order and fired on ships passing through the Straits of Shimonoseki, which were in his demesne.

The British retaliated immediately by bombarding the capital of Satsuma. The following month, September, an allied fleet destroyed the Choshu forts. Impressed by this, the Satsuma and Choshu daimio began to agitate for a policy of Westernization.

Under the pressure of these events the shogun was deprived of much of his authority. The process was continued until, in November, 1867, the ruling shogun, who had not long succeeded to the shogunate on the death of his father, handed his resignation to the young Emperor Meiji.

In early January, 1868, direct imperial rule was re-established and the former shogun was ordered to surrender his desmesnes. The new régime spent the first years in making numerous changes in the administrative structure. The senior posts were divided among the court nobles and daimio, but the actual exercise of power came into the hands of a very capable and ambitious group of samurai. Thus, from the very beginning of her modern history, we see that the military clique had great power in Japan.

On 6 April, 1868, the emperor, in an ancient ritual, announced a Charter Oath to the nation's ancestral gods and goddesses. This oath was entirely revolutionary in its concepts, and paved the way for the reforms which were rapidly effected. Its fifth clause by implication forbade anti-foreign feelings and activity, and directly foreshadowed a policy of Westernization.

Important among the first reforms were those reorganizing the social structure. Those permitting freedom of movement throughout the country, and those guaranteeing to all men of whatever class equality before the Law were the most important for the Japanese. The military caste-system was also abolished, and this made it necessary for new armed forces to be developed. It was in this sphere that Western ideas were first adopted.

The religion which the Japanese had invented to meet the requirements of their beliefs about themselves, and which was peculiar to Japan, was known as Shintoism. As has been mentioned briefly earlier, the Japanese claim to be of directly divine descent. This cult was started by Jimmu, who made himself the first emperor in 660 B.C. Jimmu claimed to be the great-great-great-grandson of the Sun-goddess, who was herself the daughter of the Creators of Heaven and Earth.

The emperors of Japan, including the present emperor, have all, therefore, sprung from divine parentage. The people themselves were also of divine descent, though in lesser degrees, since they were descended from the retinue of the grandson of the Sun-goddess, who had accompanied him when he came down to Mount Takachiho. Since Japan was the first country to be created, this automatically made it the most beautiful country on earth, the country chosen by the gods before all others, and, therefore, together with the person of the emperor to be revered by its inhabitants.

These ideas, as with the Hebrew concept of the Chosen People, were kept flourishing by the national religion which sprang from them. Shintoism, which means *The Way of the Gods*, was accepted with unquestioning faith by all classes and ranks of Japanese. Its basic principles were ancestor-worship and nature-worship. So deeply ingrained in the national character did Shintoism become that when Korean missionaries brought Buddhism to Japan in the sixth century A.D. they decided to assimilate Shintoism rather than attempt to replace it. This was a brilliant move, for it made possible, two centuries later, what was the most wholesale and most amazing conversion in the religious history of mankind. The Japanese Court and the people *en masse* accepted Buddhism—and at the same time continued to practise Shintoism.

From the late-eighteenth century it had been a revival of Shintoism which had been one of the chief factors working for the overthrow of the shogunate. To concentrate the loyalty of the people on the emperor and government, there could clearly be no better device than a religion which was as ancient as the race and in its dogmas so ready-made to achieve this object.

But to be most useful to the régime Shintoism had to be lopped of its Buddhist outgrowths, and an attempt was made to do this. It was soon discovered, however, that the two religions were completely interlocked in the average Japanese mind and the attempt was dropped lest Shintoism should be harmed. Instead, the authorities began attempts to establish a new State religion in which the

emphasis was placed on the divinity of the emperor. These attempts were extremely successful. By 1930 the new religion, known as State Shintoism, had more than 15,000 priests and more than 100,000 shrines, the chief of which was the Grand Shrine at Ise, dedicated to the Sun-goddess. By his attendance at these shrines the loyalty of the average Japanese was measured.

State Shintoism had three basic tenets; and it is these which must be constantly borne in mind in any consideration of Japan's activities from the Meiji Reformation of 1868 down to 1945. The tenets were:

1. The emperor is divine.
  2. The gods have Japan under their special protection. Therefore, its people and its very soil and every institution pertaining to it are superior to all others.
  3. These attributes place upon Japan a divine mission to bring the whole world under one roof, so that all humanity may share the advantages of being ruled by the divine emperor.
- In (3), in a nutshell, is Japan's foreign policy from the early twenties at least, to her defeat in 1945. To the fulfilment of this policy, which, put without frills, was one of world domination, her domestic policy was geared from the moment of awakening.

When Commodore Perry presented his ultimatum in 1853 Japan was two hundred and fifty years behind Western civilization in almost every facet of national existence, and particularly so in her economic and industrial structure.

In the last years of the shogunate, and before 1860, a shipbuilding yard and an arsenal had been established. By 1866 English cotton-spinning machinery and technical instructors had been imported, and a beginning had been made on the famous Yokusuka Naval Yard. The Meiji leaders took over these establishments, and added developments of their own—silk reeling, tiles, cement, woollens and bleaching powder, all of which were intended to be guides for future private enterprise.

Almost at a wave of a wand, it seemed, such an amazing advance had been made in the textile industry, mainly owing to cheap machinery and cheap female labour, that Japan was supplying one-quarter of the world's cotton-yarn exports within a few years. An almost comparable advance was made in the heavy industries and the manufacture of machine tools. The merchant navy was expanded steadily, and the shipbuilding industry was capable of building warships before the outbreak of the First World War.

Side by side with these industrial and economic developments, the Army and Navy, under expert foreign tuition, had been transformed

#### COMMODORE PERRY OPENS UP JAPAN

into fighting services equal to those of any Western power. The institution of these services rounded off the picture, so that we see in Japan the amazing phenomenon of a medieval state emerging as a modern industrial and military power within the space of a single generation.

Her new condition naturally produced for Japan a number of serious considerations. Overriding all was the injunction laid upon them by the third tenet of State Shintoism, to "bring the whole world under one roof"—the Japanese roof.

Turning her attention to those powers closest at hand, she launched her initial attack on China, and had so subdued that vast country by 1941, and had built up a war-machine so formidable in all its arms, that she felt confident that she could drive the Americans and British out of the Pacific. So in December, 1941, she struck at Pearl Harbour.

In less than one hundred years from Commodore Perry's ultimatum, she had grown from a backward nation to one of the most fantastic of twentieth-century world powers. Had Commodore Perry been able to foresee Pearl Harbour he might have had second thoughts before sailing into Edo Harbour on 8 July, 1853.

## The Bessemer Converter

### Steel for All

"Ready, Bessemer?"

"That is so——"

"You must be dreaming, man. It's only been in for—for half an hour——"

"I am aware of that. Nevertheless—I assure you—the process is complete. It remains but to run the steel off. And—as you will note—in a very considerable quantity. Watch——"

"It won't be workable, Bessemer. It would have needed far longer than this. Particularly as you have chosen the crudest of crude pig iron for your raw material——"

"Watch. You see it starting to tilt? Ah—there it goes——"

"Hmmm."

"You are surprised, then?"

"Somewhat, Bessemer. Such a white, white, heat——"

"You are in for more surprise than that. Wait till it cools."

And indeed, there were surprises ahead not only for the incredulous who watched this first demonstration of the process, but for men all over the world, as the amazing story was released. As Sir Henry Bessemer was to write, thirty-three years later in his autobiography, he was met on all sides with "The most stolid incredulity and distrust. Perhaps", he went on, "I ought to make some allowance for this feeling, for I proposed to use as my raw material crude pig iron costing £3 per ton instead of the highly purified Swedish bar iron then used, costing £15 to £20 per ton. I proposed also to employ *no fuel whatsoever* in the converting process which in my case occupied only 25 to 30 minutes instead of the ten days and nights required by the process then in use: and I further proposed to make five tons of steel at a single operation, instead of the small separate batches of 40 to 50 pounds, in which all the Sheffield cast steel was at that time made. What, however, appeared still more incredible was the fact that I proposed to make steel bars at £5 to £6 per ton, instead of £50 or £60——"

To appreciate this tremendous step forward which Henry

Bessemer took in 1856, we must consider briefly what steel is, what its uses are. For thousands of years men had won a hard, reasonably malleable substance from the earth. Occasionally it had been almost pure iron, but this was almost always when a meteorite, a thing from the great unknown, had survived entry into our atmosphere to crash into the surface of the earth. More usually it had been in the unworkable form of "iron ore" which, men soon discovered, could be treated with heat to remove its impurities. After this long, slow process, it could be hammered and bent into shape, used for tools, simple weapons.

The chief impurity in iron ore is oxygen and, as man had more or less accidentally discovered, if the ore is heated in the presence of some form of carbon, like coke or charcoal, this oxygen will combine with that, leaving more or less pure iron. The early processes of purification gave a pasty, malleable product in one operation. It was more workable than stone, harder than bronze—but it left a lot to be desired.

Then, halfway through the fourteenth century, as men experimented with bigger fires and hotter heat—the product changed. No longer was it a pasty iron which had changed slowly from one type of solid to another: now, suddenly it poured from the retort as a gleaming liquid.

Yet—disappointingly—it set, when it cooled, into an extremely hard and impossibly brittle metal, a stubborn substance which soon earned itself the nickname "pig iron".

Yet here was something far harder than iron. If but a way could be found of working it—bending, casting, sharpening it—the metal or something like it would make swords and a host of other things of a strength and durability never before encountered.

Eventually the problem was solved—though in a roundabout way. The pig iron proved to be iron (separated from the thirty per cent or so oxygen content of its ore) but with the addition of about four per cent carbon which it had picked up in the process of reduction, mixed with coke or charcoal. Surprisingly, this small proportion of carbon had altered its character entirely; if only an even smaller proportion could be added to pure iron, it might be possible to make a metal of any degree of hardness required.

This proved to be so, and the new, carbon-transformed, iron came to be known as "steel", "staal", "stahl" and other similar sounds all over Europe, all related to the word "stay" or "strong support". The pig iron could be made into almost pure iron, simply by heating it in a second furnace, away from any coke or



charcoal. If, then, a minute proportion of carbon were added to it, steel could be made. Very soft, "mild" steel came from an admixture of about 0.04 per cent carbon; very hard steel from up to 1.5 per cent.

To Henry Bessemer, the restless genius whose life was devoted to making things better, more quickly and if possible more cheaply—whether it was gold paint or revenue stamps, telescopes or artificial flowers—this was a challenge. Surely *one* operation, carefully controlled, could make steel straight from pig iron?

He studied the processes then in use, a lengthy, expensive process in which, as he later wrote: "The costly bar iron of Sweden was chiefly employed as the raw material, costing from £15 to £20 per ton. The conversion of this expensive iron occupied about ten days—that is, about two days and nights for the gradual heating of the furnace, in which the cold iron bars had been carefully packed in large stone boxes with a layer of charcoal powder between each bar. In these boxes the metal was retained for six days at white heat, two days more being required to cool down the furnace and get out the converted bars. The steel so produced was broken down into small pieces and melted in crucibles holding not more than forty or fifty pounds each, and consuming from two to three tons of expensive oven coke for each ton of steel so melted. This steel was excellently adapted for the manufacture of knives, and for all other cutting instruments but its hard and brittle character, as well as its excessively high price, absolutely precluded its use for the thousands of purposes to which steel is now universally applied."

And so the idea of Bessemer's method of conversion—from pig iron to steel—occurred to him. He reasoned that if pig iron were melted, made into a liquid state (which was easy, absurdly so: it emerged from the blast furnace which had reduced it from the ore in just that state, and Bessemer would use it that way), and if this liquid then had jets of air forced up through it, the excess carbon would combine rapidly with the oxygen in the air and be removed. If he kept up his process, his jets of air, for long enough, all the carbon would have gone and he would be left with soft iron. If, though, he controlled the point at which the air was shut off, he could make anything from the softest iron to the hardest steel.

And perhaps the most miraculous part of the "trick" was that the air itself, combining with the carbon and other impurities like silicon, phosphorus, sulphur, generated enough heat to keep the process going—and at a tremendous rate. Bessemer in fact required only air and pig iron—and no fuel whatsoever. He could either take his

molten pig iron from the blast furnace (a scheme which appealed to him) or, if that were inconvenient, heat it in a separate retort until it melted and he could pour it into his Bessemer Converter. Here, the chemical action of oxygen combining with carbon raised it quickly to a greater temperature, so that whereas the liquid metal entered the converter at about 1,350 degrees Centigrade, it soon attained 1,600 degrees.

There were difficulties, but Bessemer solved them. The jets of air had to be forced right through to the core of the metal; the blowing must only take place when all the metal was in the converter; and it had to be possible to stop and restart blowing at will. Soon the process, with these difficulties solved, had been adopted all over the world, and its bulging, pear-shaped, converters could be seen in many countries. Surprisingly, perhaps, it was more popular at first abroad than in his native England, and it was years before many Bessemer converters were working at home. Some that were, were from his own factory in Sheffield, to which steel-men from all over the world came to watch, wonder and depart to make steel by his process, at a royalty of £2 a ton. It became a matter of pride, as Bessemer grew older, that so many towns had been named after him. By the time of his death there were thirteen of them in America alone, in states from Alabama to Wyoming.

The Bessemer Converter was an immense step forward, putting steel in the hands of countries which had never dreamed of affording it, setting it to tasks which no one had ever considered it cheap—or, indeed, efficient—enough to perform, spreading itself across the world as railway lines, and, less happily, arming that world, arming it with powerful, rifled cannon and high-explosive, fragmentation shells.

It is still extensively used, though over the years, with the development of other ways of producing high temperatures, it has not remained the only method of converting iron into steel. The "crucible" method, not unlike the one described, with dismay, by Bessemer at the start of this article, is still used, with much refinement, for making high-grade steels in small quantity. The "Siemens Martin" process (or "open hearth") was developed ten years after Bessemer's own and uses the discovery that very high temperatures can be reached (higher than in the Bessemer process) by pre-heating air and combustible gas *before* setting them alight. In this process the metal (usually a mixture of scrap steel and pig iron) is fed in cold. A further method is conversion in the tremendous, easily controlled, heat of an electric furnace, operated either by an arc or by induction.

The Bessemer process, then, revolutionized not only the manufacture of steel but the uses to which it was put, turning this highly priced, toolmaker's metal, something without which the world as we know it, with its skyscrapers, its railways, its shipping, its motor-cars, would hardly exist. Who was Henry Bessemer?

He was born on 19 January, 1813, in the village of Charlton in Hertfordshire, and of English parents (though he admitted that his name "does not sound like an English one"). His father could not stay idle, and though possessed of more than enough money, set himself to building and operating a type foundry on his estate. Henry helped him, did much experiment, and soon was famous from one end of the country to the other. He had produced a machine for franking stamps which saved the Exchequer thousands a year, he had invented a cheaper lead pencil and—the thing which made him a rich man long before he thought of his steel converter—he had found a method of making gold paint every bit as good as that manufactured by a secret process in Nuremberg and selling at seven shillings and sixpence an ounce, for little more than *sixpence a pound*. Being no fool, he parted with it at eighty shillings a pound, which was considerably cheaper, even then, than the German equivalent, and within a few months he was a very rich man. He operated his secret factory with his three young brothers-in-law for thirty years—at which point he gave them the factory and the right to produce it themselves.

Among his other inventions were a new press for sugar-cane, many times more efficient than anything known, for which he was awarded a gold medal by Prince Albert; a new method of silvering mirrors; a new way of making glass; the first simultaneous braking system for a railway train (which came before its time and was rejected by the railway companies).

The knighthood, which raised him from plain Henry Bessemer to Sir Henry, was conferred on him, late in life, as a reward for having invented, forty-six years previously, the new way of printing the date indelibly on revenue stamps, which saved the Exchequer so many pounds over so many years. He had maintained all along that the idea had been his wife's, a simple but effective scheme for printing the date in little perforations, and he was delighted, at the end of his life, to be able to share this belated honour with her.

## *Charles Darwin's Bombshell*

*The Book that Revealed Evolution as the Master-Key to Nature's Secrets*

THE IDEA of Evolution is so much part and parcel of our thinking that it is hard to realize that up to as recently as the middle of the last century many, perhaps most, scientists looked upon it as being little more than an interesting hypothesis. There might have been an evolution of the rocks, that they were prepared to allow; but they could find little evidence for a similar evolution of plants and animals. While as for the Evolution of Man, the very suggestion was considered to be too far-fetched to be considered seriously. Was it not most clearly stated in the opening chapters of the book of *Genesis* that all mankind is descended from a single human pair who were specially created as the first man and woman? Why, they even knew when this had occurred, for there in the margin of the big family Bible was given the date—4004 B.C.

There are people to-day—the so-called Fundamentalists—who still hold to some such view. But there are not many of them. In all the countries of the world the great majority of scientists, as well as the leaders of religious thought and indeed most thinking men, are Evolutionists, and make no bones about acknowledging it. Evolution is no longer regarded as a supposition, but as a master-key for the unlocking of the secrets of Nature. All that we see and know has evolved from something very different from what it is at present, and not least Man himself has gone through an evolutionary process.

Obviously a great intellectual revolution has occurred, one of the most momentous and far-reaching in human history; and if there is one man who was responsible for it more than any other it is an English scientist whose name everybody has heard of, even though by no means everybody has read so much as a line of any of the books that he wrote.

Charles Darwin was born in 1809, and he lived until 1882. He was the son of a doctor in Shrewsbury, who besides marrying a wealthy wife—she was a Miss Wedgwood, one of the famous

potter's family—made a fortune out of his practice. Charles was the second son and nearly the youngest of a family of six. He went to a private day-school, where he learnt very little, and then had seven years at the great public school of Shrewsbury, where again he learnt next to nothing.

He had not the slightest interest in making Latin verses, but he *was* interested in chemistry experiments and in collecting beetles. He was also good at sport, and his father, in a fit of irritation at his lack of scholastic success, once grumbled, "you care for nothing but shooting, dogs, and rat-catching, and you will be a disgrace to yourself and to your family!" It is characteristic of Darwin that when he recorded this outburst in his *Autobiography* he was quick to add that "my father was the kindest man I ever knew".

Leaving Shrewsbury at sixteen, he proceeded to Edinburgh University to train as a doctor, but the sights and smells of the operation-room proved too much for him and he speedily withdrew. His father then thought that he might as well become a *ciergymen*, and sent him to Cambridge for three years. His time there was wasted, as far as his studies were concerned, just as had been the years at school and Edinburgh. But he read widely and made some good and useful friends, and he still collected beetles. Once he discovered a fresh species, and it was with immense satisfaction that he read one day in a book on British insects that this particular beetle had been discovered by Charles Darwin, Esq.!

Then he had a stroke of great good fortune. One of his friends among the dons recommended him for the post of naturalist to accompany an expedition that was being sent out by the Government to make a survey of the coasts of the most southern parts of South America. Darwin nearly lost the opportunity. His father was against his accepting the offer, and Captain FitzRoy, who was to command the expedition in his ship *H.M.S. Beagle*, when he first met him didn't like the shape of his nose, since it suggested to him a lack of energy and determination. . . .

But the objections, parental and nasal, were overcome, and in 1831 Darwin sailed from Devonport on the *Beagle*, and he did not see England again until the autumn of 1836. To begin with, he was most horribly seasick, but before long he was enjoying himself in a crowd of fresh sights and experiences. He wandered in a tropical forest when they first touched land in Brazil, and oh, the wonder of it! "To a person fond of natural history", he wrote in his journal, "such a day as this brings with it a deeper pleasure than he can ever hope to experience again." He rode with cowboys across the

pampas, and joined in a kangaroo hunt in the Australian bush. He enjoyed the hospitality of slave-holding planters, and took back with him an undying hatred of slavery as an institution. In Tierra del Fuego he saw the human species at its lowest: "The sight of a naked savage in his native land is an event which can never be forgotten."

He gave full vent to his passion for collecting, and the sailors were so amused that they dubbed him "The Flycatcher". Now and again he fell out with FitzRoy, whose temper was none of the easiest, but it is noteworthy that it was the Captain who christened Darwin Mountains and Darwin Sound in Tierra del Fuego, in recognition, as he said, of the young man's exertions beyond the call of duty. Very shortly Darwin had discovered that "the pleasure of observing and reasoning was a much higher one than that of skill and sport", and when he went ashore he left his gun behind. Years later when he looked back on the voyage in the *Beagle*, he declared that it had been the most important event in his life and had determined his whole career.

When at length he got back home he told his father that he had decided on what he wanted to do. "Adding a little to Natural Science," is how he expressed it, and his father raised no objection; after all, the boy was old enough now to know his own mind, and there was no question of his having to earn his living, with so much money in the family. But Natural Science is a big enough subject in all conscience, and it was some time before Darwin had settled on the particular part of it that he would do his best to add to. Then as he arranged his notes and specimens that he had brought back with him, his mind kept reverting to something that he had often observed and pondered over. On every hand he had seen "organisms of every kind beautifully adapted to their habits of life". But how had they managed to do this?

The problem, so he tells us, haunted him, and he decided to collect as many facts as he could on the variation of plants and animals both in a state of nature and when domesticated, with a view to discovering just what had made them change and adapt themselves. "My first note-book was opened in July, 1837," he recorded; this was less than a year after the return from the voyage.

For nearly twenty years he worked on the problem, collecting facts, writing them down, comparing them, evaluating them. He was able to do this because he was supremely fortunate in marrying a woman who was an excellent manager and let him work away undisturbed. She was a cousin, Emma Wedgwood, and all that we

read about her is pleasant and to her credit. For some years after their marriage in 1839 they lived in London, but Darwin got tired of dining out and frequent callers and making calls, and in 1842 they moved to a large house that he bought on the outskirts of the little village of Downe, in Kent. For forty years Darwin lived there in the most happy circumstances—but for his health. What he actually suffered from is not clear, but there is little doubt that he was somewhat hypochondriacal. Emma nursed him, read to him, listened to talk which she often did not properly understand, and, not least, bore him ten children in seventeen years.

Year after year went by, with Darwin still plodding away at his note-books. He thought that there was plenty of time, since the subject was not one that had attracted the attention of other workers in the field. At least that is what he thought; in fact, he was wrong, as we shall see. Soon after his removal to Downe he had sketched out his theory in 35 pages; in the summer of 1844 he enlarged this to 230 pages. More years passed, and still he had nothing ready for the printer. The friends with whom he had discussed it urged him to "get a move on", and in 1858 he had got a book almost ready.

Then one morning in June of that year he received a nasty shock, in the shape of a letter from another British naturalist with whom he had been having some friendly communications on matters of common interest. Alfred Russel Wallace was his name, and he was a naturalist exploring in the East Indies. But for years, it transpired, he had been working on the very problem which Darwin thought he had made his own. And now, accompanying his letter, was a manuscript in which the theory he had arrived at was outlined. In all essentials it was the same as Darwin's; "if Wallace had had my MS sketch written out in 1842", he noted, "he could not have made a better short abstract!"

Darwin's first reaction was to declare that he would rather burn his book than that Wallace "or any other man should think that I had behaved in a paltry spirit". But eventually (since both he and Wallace were Victorian gentlemen) the matter was satisfactorily arranged. It was settled that a joint statement should be prepared, and this was read at a meeting of the Linnean Society in London on 1 July, 1858. Strangely enough, none of the small audience of thirty fellows who heard the paper read seems to have thought that the theory was at all out of the way. But when at last Darwin's book was published, in November, 1859, a storm broke about his ears.

The book's full title was *The Origin of Species, by means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life.*

It was a big book, of nearly 600 pages, and by no means easy reading. But the first edition of 1,250 copies at 15s. each was sold out on the day of publication, and a second edition of 3,000 copies that was rushed through the press was likewise soon disposed of. Four further editions were published in Darwin's life-time, and the book still sells, since it has long been acknowledged as one of the great classics of Science.

Now, what was the book about, and why did it cause such a furore? In the first place, it should be made quite clear that Darwin did not "discover Evolution", as is sometimes alleged. There were evolutionists among the thinkers of ancient Greece, and in the eighteenth century Lamarck in France and Darwin's own grandfather, Erasmus Darwin, had advanced theories of an evolutionary character. And among Darwin's own circle of intimate friends there was at least one—Herbert Spencer—who was quite convinced of the truth of Evolution, even though he was not in a position to prove it. This is where Darwin had the advantage; if he did not prove it beyond any doubt—he could hardly have done so in the then state of scientific knowledge—he made it seem exceedingly probable, and suggested a way by which it might have been brought about.

At the outset he was not a believer in any evolutionary theory himself; like nearly every one of his contemporaries, he thought that each species of animals and plants had been independently created. Even after his return from the voyage in the *Beagle* he was still far from sure that this had not been the case. Then he happened to read *The Principle of Population* by the Rev. T. R. Malthus that had been first published in 1798, and this book gave him the clue he had been looking for.

Malthus demonstrated how there was a natural tendency for living creatures to become so prolific that in a few years they would fill the world, that is, if they were left to themselves. But in practice their numbers were kept down by a lack of sufficient food, and they were obliged to struggle among themselves to survive. Darwin had already seen evidences of such a struggle in his studies of plants and animals, and now it struck him that "under these circumstances favourable variations would tend to be preserved, and unfavourable ones to be destroyed. The result of this would be the formation of new species." To this process he gave the name of Natural Selection.

"Although much remains obscure, and will long remain obscure," he wrote in the introduction to the *Origin*, "I can entertain no doubt, after the most deliberate study and dispassionate judgment



of which I am capable, that the view which most naturalists until recently entertained, and which I formerly entertained—namely, that each species has been independently created—is erroneous. I am fully convinced that species are not immutable; but that those belonging to what are called the same genera are lineal descendants of some other and generally extinct species. . . . Furthermore, I am convinced that Natural Selection has been the most important, but not the exclusive, means of modification.”

Well, that was his conclusion; and looking back, it may seem difficult to understand what all the fuss was about. For fuss there was, and plenty of it. As regards the scientific world, quite a number of the leading scientists ranged themselves on Darwin's side, notably Professor Thomas Huxley, who acquired the nickname of “Darwin's bulldog” on account of his spirited championship of the Darwinian theory. But the general public, and even some scientists, were greatly worried about the theory's implications. If the different species of plants and animals had evolved, could they draw the line there and exclude Man? Might it not be argued that Man, too, had evolved? To the Victorian self-esteem Darwin's book came as a bombshell. “What, us—descended from monkeys? Perish the thought!”

This point was seized upon by Bishop Wilberforce, when at a meeting of the British Association at Oxford in 1860 he crossed swords with Professor Huxley. The Bishop had “crammed” up the subject (runs one account of the famous incident) and knew nothing of it at first hand. He ridiculed Darwin badly and Huxley savagely, and then slipped into banter. “I would like to ask Professor Huxley”, he said, “as to his belief in being descended from an ape. Is it on his grandfather's side or on his grandmother's that the ape ancestry comes in?” Nothing of the kind had been alleged, of course, but Huxley rose to the bait. “I should feel it no shame to have risen from such an origin,” he declared, “but I *should* feel it a shame to have sprung from one who prostituted the gifts of culture and eloquence to the service of prejudice and falsehood.” The effect was tremendous; at least one lady fainted and had to be carried out. . . .

Huxley delighted in such contests; Darwin kept well away from them. He just carried on with his chosen work, and published a new book every now and again. The best known of these is *The Descent of Man*, published in 1871, in which he definitely applied his theories to the Development of Man. It was quite uncompromising in its assertion that “Man is descended from some lowly organized form . . . and still bears in his bodily frame the indelible stamp of his lowly origin,” but it created nothing like the angry stir that had saluted

the *Origin*. The first book had broken the ice, as it were, and the idea of Evolution was now pretty generally accepted. When Darwin died in 1882 he was buried in Westminster Abbey, as befitted a man who had added such immense lustre to Science. And the passing of the years have only added to his fame.

This is not to say that his particular theories are accepted nowadays as the final word: they are not. A great deal has been discovered since Darwin wrote, particularly in the field of Genetics, about which absolutely nothing was known in Darwin's time. He had never heard Mendel's name so far as we know, and had no suspicion of the existence of genes and chromosomes. If Darwin could come back to-day he would find that his theory had been changed in the light of this new knowledge, although in main essentials it is still accepted as the most likely explanation of the way the evolutionary process has worked. He would not have been in the least surprised or minded. Science must advance, and theories are but stepping-stones to further progress.

What he was chiefly concerned with was the truth of the principle of Evolution, and that stands four-square. So, looking back on his momentous career, we may surely agree with what he himself wrote in his *Autobiography* about it: "As for myself, I believe that I have acted rightly in steadily following and devoting my life to Science."

## ‘Das Kapital’

### *Karl Marx Paves the Way for Communism*

IN THE history of the Western world, at all events, there have appeared, from time to time, books which by reason of the theories set out in them have had a great influence on the development of men. Such a one was *The Origin of Species* of Charles Darwin, which put forward for the first time the principle of Evolution in Nature. Another was Adam Smith's *Wealth of Nations*, which still forms the starting-point of the study of political economy; while Sigmund Freud's *Studies in Hysteria* and the *Interpretation of Dreams* opened the way to the understanding of human behaviour and was instrumental in removing the social stigma from insanity.

Others could be mentioned, but influential though these books have been on men's lives, none has so directly affected day-to-day existence—and in a paradoxically indirect way—as Karl Marx's *Das Kapital*. For it is the Marxist materialist conception of history that forms the basis of Communism, which in turn, by being diametrically opposed to Capitalism, has divided the world into two ideological camps.

Since the economic philosophy regulates the political philosophy in both camps, the Common Man in both cannot escape from the effects of one or other of the ideologies; and since Marx taught that by their nature his principles have a world-wide application—which must be imposed by revolutionary means if need be—in one half of the world men are plotting the revolution and in the other half are planning to resist it.

Karl Marx, the son of a Jewish lawyer, was born on 5 May, 1818, at Trier, in the Rhineland. Beginning his education at Trier high school, in October, 1835, he entered Bonn University to study law. He remained at Bonn only a year before moving on to Berlin University, where, besides working at his studies with moderate keenness, he discovered poetry, for which he developed a moderate passion.

In 1838 Marx's father died, and Karl made yet another move, this time to the University of Jena. By now he had decided to abandon

the law and take up an academic career. For this reason when he presented his thesis for his doctorate in philosophy in 1841, he chose for his subject *The Difference between the Natural Philosophy of Democritus and of Epicurus*.

Having been awarded his doctorate, he went for a time to Bonn at the invitation of a friend, Bruno Bauer, who was a lecturer in the University, with the object of discovering whether the academic life was really what he wanted. After some months, he decided that it was not, and when he was offered the editorship of a new newspaper, *The Rheinische Zeitung*, which had been founded by a group of young disciples of the philosopher Hegel, to counteract the influence of the reactionary *Kölnische Zeitung*, he accepted the offer and in May, 1842, he moved to Cologne.

Very early in his journalistic career he earned the reputation of being the first German journalist of note. This reputation he achieved by the fearlessness and ruthlessness with which he attacked the Prussian Government in his articles, the courage and ferocity which he displayed being totally different from the subdued and compliant journalism to which the censorship had accustomed the public.

Marx's interest in philosophy was now superseded by a penetrating and extensive interest in practical politics, and he used every opportunity to press for reform of what he considered to be outmoded Prussian laws. In the process, he flouted the censorship, challenged the Prussian Government and brushed aside the advice of friends.

Though his editorship of the *Rheinische Zeitung* changed the direction of his interests and made him a prominent figure in Germany, it was during this period that he began to conceive the theories which were eventually to earn for him a world-wide and enduring fame.

In March, 1843, unable to countenance Marx's attacks and his utter disregard of the censorship laws, the authorities suppressed the *Rheinische Zeitung*. Marx chose this point in time to end his seven years' engagement to the daughter of an official of the Prussian administration of Trier, Jenny von Westphalen, by marrying her.

Marx had been expecting the closure of his newspaper for some time, and had made plans for continuing his attacks on the Prussian Government in a newspaper to be published abroad. So, in November, 1843, he and his wife arrived in Paris. From this time, except for a few months during the German revolutionary outbreaks of 1848-1849, he was to be a permanent exile from his homeland.

In Paris, where during the next fifteen months his thoughts ripened, he met Friedrich Engels. The two men formed a life-long

friendship, and were later co-founders of the Communist Party.

The mid-nineteenth century was a period of growing revolt by the masses from their exploitation by the ruling (capitalist) classes, and Socialist movements, some moderate, some extreme, were springing up everywhere. Wherever such movements functioned, the authorities kept a keen eye on them and did not hesitate to take suppressive action when they looked like becoming too menacing to the existing order.

Early in 1845, because the French authorities were beginning to view his activities with too great interest, Marx moved to Brussels. A short time later he visited England, where he made contact with working-men's organizations in London and Manchester.

Until now he had kept aloof from the Socialist organizations which were not only travelling the same path as himself but working to put their ideas and ideals into practice. But this visit to England made him aware that verbal attacks on the evils of the social order as he saw them were not enough.

Returning to Brussels, he began to plan for the active co-operation and collaboration of the Socialist—now called Communist—groups of all nationalities, and he travelled extensively to meet as many of the groups as he could.

As a result of these ideas and discussions an International Communist League was formed, and in December, 1847, at the Second Congress of the League, held in London, Marx presented to the delegates a *Communist Manifesto*, which he and Engels had drawn up.

The Manifesto set out the principles of Communism as conceived by Marx and Engels, indicated the ways in which the practical parts of the teaching might be applied, and advocated a series of reforms which, in the political climate of the times, appeared to the traditionalists as the height of revolutionary madness.

Following rapidly upon the publication of the Manifesto—though not as a result of it—came the outbreak of the second French Revolution, which sent a wave of revolutionary activity rippling through western Europe, including Germany. On receiving the news from Germany, Marx and Engels hurried there, but before they could make an effective contribution the movement ground to a halt.

As a result of their involvement, Marx and Engels were listed by the Belgian authorities as dangerous persons, and expelled. The Marxes, with their three young children, settled in London, where they lived for the rest of their lives.

Marx now devoted all his energies to promoting Communism. At the same time he was developing his thought and formulating

the theory for which he will certainly be remembered so long as our planet is inhabited. By 1867 he had consolidated his thought, and in that year he published the first volume of *Das Kapital* (two further volumes were to be published after his death) in which he set out his doctrine in full.

Marxism is a philosophy of history implemented by an elaborate economic theory. The philosophy claims to show the inevitability of full Communism—a classless, collectivist order in which natural resources and manufactured wealth are distributed according to need, and in which the state, law, money and the concept of economic value, having lost their functions, have withered away.

The most important elements of Marxist doctrine are: determinism, the economic interpretation of history, dialectics, the class struggle and the labour value theory.

One of the most original minds among the Marxists, Rosa Luxembourgh, spoke of the Marxist Socialist creed as being built on “the granite foundation of objective historical necessity”. The determinism of Marxism, while promising victory to the working classes, nevertheless has to call upon them to make sacrifices in order to bring about the essential developments.

But this raises a fundamental problem, for why should sacrifices have to be called for, if universal Communism is inevitable? The working classes are not slow to ask this question, so the Marxist philosophers are faced with an insoluble dilemma, for the problem though related to is not identical with the issue of free will and causal necessity as met with in general philosophy.

Marx never gave anywhere in his writings an explicit and comprehensive formulation of what he meant by the “economic interpretation of history”. The main difficulty here is the interpretation of the word *economic*. Though Marx scattered allusions to the meaning of this doctrine and even partial expositions of it throughout his writings, and though Engels, with Marx’s approval, tried to supply more extensive explanations, the lack of clear-cut definition remains.

This has led to a certain amount of disagreement among Marx’s intellectual successors. But despite the absence of detailed interpretation, this Marxist law can be stated in general terms.

Economic developments, it says, are the bases of social evolution. Ideas, laws, politics, institutions, religious beliefs, even artistic expression, are changed by gradual changes brought about in the economic foundation by ever-developing technological knowledge.

Put more simply, history evolves as and how man increases his

control over nature. Although the speed of this technological progress can be regulated by political, legal and other developments, it can never be slowed down to a stop, nor can its achievements up to the present ever be reversed.

This economic interpretation of history tends to overstate its case by denying that a man's intellectual and spiritual development has any independence of the effects of the inevitability of economic change. Nevertheless, this Marxist law has firm foundations, to the extent that the social consequences of economic progress can be forecast; and there is no doubt that all the social sciences have been greatly enriched by the attention it has drawn to technological progress as a cause of some important cultural and institutional developments.

Dialectic is a term in logic which primarily means the art of testing truth by discussion. In the philosophical system expounded by Hegel, under whose influence Marx came very early in his career as a journalist, it came to mean “the tendency of a finite object or notion to suppress itself, to develop contradictions”. Such dialectic occurs, Hegel stated, not only in thought and science, but in nature and history.

This Hegelian use of the term was adopted by Marx, and in applying it to his other doctrines he expounded the Marxist dialectic that all important historical development is achieved through an all-out clash between the old and a new social principles.

In other words, reform, which only transforms the present system, is antipathetic towards Marxism; only revolution can achieve the required ends.

The Marxist doctrine of class-struggle derives directly from the Marxist dialectic. Marx went far beyond the obvious truth that different social groups have interests that conflict, the conflict being expressed in warring political creeds, and stated that the classes can never have any common interests, and that, therefore, there must be a constant pitiless and all-out struggle between the classes.

The success of the new ruling class in this kind of struggle must be followed by the repression and extinction of the old ruling class. In the struggle of the workers against the capitalists, the dictatorship of the proletariat will be the transitional link between Capitalism and full Communism, the latter being a system of social organization based upon common property or an equal distribution of wealth and income.

The Marxist interpretation of the economic development of history is based upon the theory of the “exploitation of labour”.

Marx accepted the classical economic doctrine that the value of a commodity depends on the amount of labour required to produce it, and he extended the principle to the value of labour itself.

He contended that labour itself is a commodity which can be bought and sold like any other commodity, and that its value is determined by the cost of living and education. However, because a worker can work more hours than are necessary for him to provide himself with the cost of living and for him to be in a position in which he can afford to reproduce himself, labour is the only commodity that can produce a value greater than its own value.

The product of surplus labour is surplus value, and surplus value is appropriated by the employer in the form of profits, interest and rents; that is, all income that is unearned.

From this, Marx argued that the exploitation of labour is the only source of profit, and that since this is so, the rate of profit depends largely on the number of workers employed. Machines cannot be exploited, but they can be profitable to the individual employer since they give him an advantage over his competitor. However, as the outlay for machinery increases in relation to the cost of the workers' wages, so profits decrease in relation to the whole of capital outlay.

Against this process, which is inevitable, the Capitalist cannot protect himself, and gradually he will come under pressure from the workers, who will demand from him the means of existence. Since he cannot provide these means, his system will collapse and the power will be assumed by the workers.

There are of course weaknesses in all these theories. Marx himself could not reconcile several of them. But despite these weaknesses, Marxism has been a much greater influence on political thinking in recent times than any other system of political philosophy. Its doctrines formed the bases for the evolution of modern Communist philosophy and practice as devised by Lenin, the founder of the first great Communist state.

Lenin's interpretation of Marxian doctrine provided for the total transformation of man and society, first in Russia and then throughout the world by a process of revolution. It is in Marxism-Leninism, as this interpretation is known, that the Marxian theories and doctrines exert their influence, either positively or negatively, on mankind to-day. For whether involved in or opposed to Communism, no one can escape the consequences of the ideas which, in *Das Kapital* and some of his other writings, Marx put forward.



# *The Unification of Germany*

## *Portent of World Strife*

THE GREAT land-mass of Central Europe from the Baltic to the Alps, and the Rhine to the Vistula, had, from the earliest times, been inhabited by groups of people who, though often bound by a common language, governed their own affairs, as tribes in ancient times, as kingdoms, principalities and duchies in later times, each with its own headman or ruler.

Throughout history they had waged war upon one another, made alliances with one another and resisted every attempt to form them into one cohesive nation under one leader. In the latter half of the eighth century A.D., however, there appeared upon the scene a Frankish king known as Charlemagne.

When their father died in A.D. 768, Charlemagne and his brother Carloman both became kings of the Franks. The difficult situation to which this arrangement gave rise resolved itself when the death of Carloman left Charlemagne in control of the whole kingdom.

In a reign of forty years, most of which Charlemagne devoted to warlike action, he conquered the Kingdom of Lombardy in Italy and brought much of that country under his rule; he passed over the Pyrenees and drove back the Moors behind the Ebro; and over the course of years he brought the Bavarians and the Avars, the Danes and the Saxons under his rule.

By A.D. 800 he was the most powerful ruler in Europe. In this year, in answer to an appeal from the Pope, he visited Rome, and while there, on Christmas Day, he was crowned emperor of what was to become known as the Holy Roman Empire.

This new Empire was, in a sense, the successor of the older Empire of Rome, and Charlemagne regarded himself in a large measure as the inheritor of the titles and rights of the earlier Roman emperors, despite the fact that the empire governed from Byzantium was still in existence.

From this time, until the Empire was abandoned in 1806, one of the German princes was recognized as having supremacy over the rest. There was no hereditary right of succession, but the dependants

of a powerful emperor usually retained the succession for generations. The emperor, therefore, achieved his status by a mixture of descent and election.

The fact that there was an emperor in no way unified the many kingdoms and principalities over which he held sway. Indeed his authority over the individual states was extremely limited. In another aspect, however, the Holy Roman Empire did represent a unifying influence in Christendom. Beside it stood the Papacy, actually dominating the entire ecclesiastical organization of Western Christendom, and claiming for the Pope a spiritual authority overriding that of the emperor as the temporal head of Christendom. Nevertheless, the struggle for imperial status was a constant one among the more powerful princely rulers.

By the end of the thirteenth century the medieval European system had begun to break up largely as the result of this struggle for the imperial crown which entailed endless war, and in an attempt to prevent this situation from continuing an electoral system was brought into operation. Certain of the more important states were designated in the persons of their rulers, members of an electoral college, whose majority vote bestowed the imperial crown. Though this system reduced the physical struggle, it could not completely eliminate attempts to win votes of the Electors by persuasion or coercion.

In time, though the electoral system continued to exist, it developed into a mere matter of form, and functioned only properly when there was more than one claimant to the imperial crown. In 1437, Albert of Hapsburg became emperor, and from this time until 1806, with one exception, Charles of Bavaria, a Hapsburg wore the imperial crown.

In 1519, Charles V succeeded his grandfather Maximilian I as emperor, while the hereditary Austrian and other German possessions of the Hapsburgs were transferred to his brother Ferdinand. Charles attempted to establish the personal supremacy of the emperor throughout Germany, but failed. The German princes, both great and small, refused to surrender any part of their almost complete independence.

By the Thirty Years War (1618-1648) Ferdinand II tried to bring the Protestant princes into subjection, while Wallenstein, his outstanding general and favourite, worked tirelessly, but in vain, to bring about a Germany united under the absolute power of the emperor, but enjoying religious toleration.

After the Thirty Years War, the independence of the greater

German princes was an established fact, while the still nominal imperial authority was little more than a fiction. The struggle of the next hundred years between the Bourbons of France and the Hapsburgs was not a struggle between France and the Empire, but between France and the Hapsburgs.

Yet another attempt to establish imperial ascendancy by the consolidation of the Hapsburg dominions in Germany failed on account of the formation of the League of Princes by Frederick of Prussia to maintain the constitutional rights of the German princes; in other words, their freedom from imperial control.

When in 1792 the French Republic went to war, it was not against the Empire, but against Austria, despite the fact that the Austrian ruler was the Holy Roman Emperor; and it was Austria, not the Empire, which Napoleon finally brought into submission at Austerlitz in 1805. By this time Napoleon had proclaimed himself emperor, and as there was no longer any plausibility in maintaining the pretence that there was one imperial head of Christendom, in 1806 the Emperor Francis dropped the title and the Holy Roman Empire ceased to exist.

Germany was now in theory what she had long been in practice—a geographical expression; while her master was Bonaparte, who could carve her into pieces as the whim took him. In 1806 the Prussians were defeated at Jena, and in the following years a new spirit arose in that country, and to some extent in other parts of Germany, which resulted in a war of liberation against Napoleon, culminating in Waterloo.

In 1806 Napoleon had formed a Confederation of German states. This was dissolved in 1814, but immediately replaced by a more lasting one, which sealed and stamped a territorial revolution of the first magnitude. The Germany of the Middle Ages had disappeared; most of its 300 states had vanished; only 39 remained; and these formed the new German Federation or Bund. Austria and Prussia were its chief members; among others were the Kings of Bavaria, Hanover, Saxony and Württemberg.

The history of the next fifty years is mainly a struggle for constitutional liberty. Several of the states had a States Assembly consisting of nobles and prelates, but there was nothing in the way of representative institutions nor had any of the rulers any idea of their responsibilities towards their peoples in the modern sense. This movement, however, was too strong to be crushed, and eventually, with Saxe-Weimar leading the way, several rulers granted constitutions to their peoples.

Another movement of the time was towards uniformity in commercial matters. Trade could never flourish in a country where import duties varied with each state, and where every few miles there was a boundary with its inevitable customs house. After several attempts, at last, in 1834, one trade area was formed.

Only Austria elected to stand outside this common market; an error which, by making it easier for Prussia to achieve dominance, indirectly led to her own undoing.

The popular passion for union now led to a powerful agitation which compelled the Bundestag, the assembly of the Federation, to agree to a meeting of a national Parliament in Frankfurt. The members, elected on a wide franchise, met together to draw up a constitution for a united Germany. Having decided to have an emperor, they offered the honour to the King of Prussia, who declined it; and as far as immediate results went, the Frankfurt Parliament was a failure.

The duel between Prussia and Austria for the leadership of Germany was now entering the final phase. In 1849 Prussia managed to form a union, but trouble in Hesse led to the calling in of Prussian and Austrian troops by the conflicting sides. But just as war seemed inevitable, Prussia gave way, and the union was dissolved.

By this time the question of Schleswig-Holstein was dominating German politics. The war against Denmark, though waged nominally by the Confederation, was in reality waged by Prussia with the help of a few other states. The conflict was suspended for diplomatic negotiations, but when no agreement had been reached by 1863, Saxony and Hanover reopened the war. Though Prussia and Austria disapproved of their action, fearing for their prestige, both announced they would act as independent states, marched against the Danes, and annexed Schleswig and Holstein.

From this event, Prussia was able to draw the excuse she was wanting for making war on Austria. The latter wished the Bundestag to decide the future of Schleswig and Holstein. Prussia suggested a drastic reform of the Bund from which Austria, who had chosen to remain out of the trade organization, should be excluded. Both presented their suggestions to the Bundestag, which accepted Austria's. Prussia at once declared war on Austria, and on 3 July, 1866, after a campaign of seven days, totally crushed her at Sadowa.

Since the majority of the other German states had supported Austria, all shared in the humiliation. The war ended the connexion of Austria with the other states of Germany, and led to other changes, which increased both Prussia's power and her size.

A new union was set up, the North German Confederation. It included all the states north of the Main; its head was the King of Prussia.

This King of Prussia was Frederick William IV, who had appointed as his Chancellor, or chief minister, one of the most remarkable men this part of Europe has ever produced—Prince Otto von Bismarck.

Bismarck had first entered upon the political scene in the various Parliamentary assemblies which, in 1848, ended in the granting of a constitution to Prussia, of which he was ever a fierce opponent. A Royalist to the core, it was he who had prompted the king to decline the offer of the imperial crown by the Frankfurt Parliament in 1849, on the grounds that its tender was based on a popular will and not on the concurrent assent of the German sovereigns.

As Prussian representative in the Bund from 1851, he had been quick to see that German unification could never be achieved so long as reactionary Austria blocked the way with her claims to the position of leader of a united Germany, a leadership which he was determined should pass to Prussia.

In 1862 he had so impressed the king with his abilities and his ideas that he was appointed Chancellor, a post which automatically gave him the opportunity for implementing his plans for securing Prussian supremacy.

On his appointment he proclaimed: "It is not by speechifying and majorities that the great questions of the day will be decided, but by blood and iron." From that moment he began to plot with cunning and ruthlessness unmatched, the policy by which he was determined to achieve his ambition.

As we have seen, within four years he had eliminated Austria, and formed a union of the northern states under Prussian leadership. All he needed now was to prove beyond doubt to the German states remaining outside the Northern Confederation that Prussia was undisputed master of them all. This he hoped to achieve by provoking a war with France from which Prussia would emerge the victor.

Over the next four years he continuously goaded France, whose own ruler, Napoleon III, appeared to go out of his way to aid Bismarck in his schemes by announcing a desire to push the frontier of France to the Rhine. For all his talk, however, Napoleon appeared loth to take action to forward his ambition, until eventually Bismarck decided that he must be forced to it.

Once again the Iron Chancellor was favoured by fortune. The Spanish throne fell vacant and there was no hereditary successor.

Among the candidates put forward was a prince of Frederick William's own house, Prince Leopold of Hohenzollern. Napoleon, fearing Prussian encirclement if Leopold were elected, somehow persuaded the prince to withdraw, and instead of leaving well alone he sent his ambassador to William requesting a promise that Leopold's candidature would not be renewed. The king refused, and later in the day declined to reopen discussions.

From Ems, where he was staying, he sent a telegram to Bismarck in Berlin acquainting him of what had taken place. Bismarck thereupon published the telegram, but with certain alterations which read: "His Majesty refused to receive the ambassador, sending word that he had nothing more to communicate," which made it appear that instead of a courteous refusal to give his promise which had really happened, the king had dismissed the ambassador.

This version reached Napoleon before his ambassador's report, and without waiting for the latter, in his indignation, he immediately declared war on Prussia to avenge the insult.

This was exactly what Bismarck wanted. His armies were ready; his spies had penetrated French military secrets; he knew Prussia's strength; and he knew Napoleon's weaknesses better than Napoleon knew them. With all the German states at Prussia's side—for Bismarck had made secret treaties with the southern states to come to her aid should she be attacked—she marched.

Within two months the Prussian armies were at the gates of Paris; within six months it was all over.

With the brilliance of the campaign and the certain knowledge of victory to support him, Bismarck proposed a new union to the princes, this time of all the German states. All saw, or were persuaded to see, the advantages of such a union, since all would share in the fruits of Prussian successes.

So, on 18 January, 1871, the 150th anniversary of the founding of the Prussian state, and six days before peace negotiations were opened with the French, amid scenes of great splendour in the Palace of Versailles, Bismarck read to all the assembled German princes the proclamation of the new German Empire, or Reich, with William its first Kaiser.

For the first time in the history of Europe, Germany was united into one nation, under one supreme head. Had any contemporary statesman outside Germany been able to foresee what this unification portended in blood and lives less than half a century later, and again from 1939 to 1945, perhaps he might have been tempted to intervene.

## *The Voice in the Wire*

### *Bell Invents the Telephone*

FOR THREE generations the Bells had been teachers of speech—and with a name like that, with all its suggestion of clear sound, how correct, how appropriate. First there had been grandfather Alex, cobbler in St Andrews, who had discovered he possessed such gifts as an actor and an elocutionist that he threw away his last and became both these things. His son, Alex Melville Bell, followed his example, became superlatively good as a teacher of speech to those who through deafness had never mastered it, and as "Professor Bell" became a household name on both sides of the Atlantic.

And his son, Alexander Graham Bell, grandson of the cobbler, inherited the family gift. He was able to impart the gift of speech to sufferers who had given up all hope of normal human contact, he had a sympathy wedded to his skill which made men say that here was more than a fit successor to his father, here was the finest teacher of all time. And he is remembered, not for this, but as the inventor of the telephone.

Sadly for Scotland, he did it in America. As a child he had been sickly, like his brothers, and they had died, one after the other, of consumption. When it looked as if Alex Graham would follow them to an early grave, his father decided that now was the time to get out of Britain, with its fogs and its damp. He knew the United States and Canada well, he had lectured in both countries, demonstrated his methods, and in 1870 he took his little family to Canada.

They settled near the little town of Brantford, and within weeks Professor Bell knew he had made a wise decision. Young Alex Graham—the doctors had given him six months to live, based on the case histories of his two brothers—began to put on weight, stopped coughing. He was not a child; he had qualified, under his father's guidance, as teacher of speech and elocution, before they left Scotland, and now, with this miraculous improvement in health, there seemed a future for him. His father, who had more work than he could cope with, asked him to go south, cross the

border to Boston, give a lecture for him. He did so; the lecture and demonstration were such a success that he was urged to leave Canada altogether, settle in Boston as teacher of "Vocal Physiology".

He did so and was lucky in that the parents of a small boy who was stone deaf and yet making remarkable progress in his class decided they would invite Mr Bell to come and live in their large house outside Boston. Young Georgie would always be there, at meals, watching, studying his master and hero. Graham Bell was only too pleased, and he found, in the generous accommodation that was put at his disposal, that he had room to experiment with a hobby which he hoped would some day bring him a great deal of money. For Graham was in love—with a deaf girl, a pupil, the beautiful Mabel Hubbard—and he needed money, lots of it, to get married. The money-making hobby was his "Multiple Telegraph" with a theory closely allied to Bell's study of the human voice and ear. If he could make it work, the same pair of wires could be made to send more—far more—than one message, at the same time. Obviously, if it were successful, this invention would be of the greatest use to the telegraph companies. Then Graham mused, he would become rich, able to marry.

The "vocal" principle on which he was working with his telegraph was one of "tuning" a telegraph receiver to a distant transmitter, by sending the dots and dashes of the Morse Code in "buzzes" of different pitch. If each receiver only responded to the pitch to which it had been set, he would be successful.

Experiments were encouraging, but by no means conclusive. It was during the course of them, working with a young assistant, Thomas Watson, that Graham Bell began to consider the possibility of sending the various notes of the human voice down a wire in the same way. By shouting into their transmitter, with its differently tuned reeds, they were able to get faint response, in the next room, from the receiver. Try as they would, they were unable to improve on it. They could produce, by screaming their heads off, a faint humming at the receiver; that was all.

Their interest mounted, however, and soon Bell was so excited by the discovery which seemed to lie just round the corner that he began to neglect his work on the telegraph. His future father-in-law, Mr Hubbard, grew incensed, said that unless he gave up the time-wasting nonsense of this Electric Speech and concentrated on his telegraph, he would have to give up all thought of marrying Mabel.

Convinced he was on the threshold of some great discovery, Graham faced his dilemma and went on with Electric Speech.



A few days later, on 10 March, 1876, he was proved right. For months since the first feeble twang there had been no progress. Then to-day the faithful Watson was listening, as usual, ear hard against Bell's receiver, for anything that might come through. They had adjusted both machines a dozen times during the morning. Suddenly—perfectly, frighteningly, clear—came the words:

"Mr Watson, come here—I want you!"

Bell had spilt a flask of acid down his clothes; being a poor man, unable to buy himself any more, he was appalled at what he had done. If young Watson would only dash in from the next room, help with bowls of water while he mopped, the trousers might yet be saved.

But to Watson, the crisis, whatever it might be, was trivial. Bell's words had come to him, not through the air, but along wires, had emerged from his little receiver, loud and clear. He ran into the next room, blurted out his news and drove all thought of trousers from Bell's mind. Like children playing some game, a vocal musical-chairs, they hopped from one room to the other, reciting poems to each other, singing snatches of song.

And so the first words came by wire. That night Graham wrote his mother. "March 10th, 1876—this is a great day for me. I feel that I have at last struck the solution of a great problem and the day is coming when the telegraph wires will be laid on to houses just like water or gas, and friends converse with each other without leaving home."

Within two years Bell was demonstrating his amazing invention, in England, to Queen Victoria. Before that, he astonished people at the Centennial Exhibition in Philadelphia, commemorating the hundred years since the signing of the Declaration of Independence. Transmitter and receiver were separated by five hundred feet of wire, and the distinguished visitors to the Centennial were thunder-struck to hear Bell's voice squeaking through with "To be, or not to be, that is the question——", then to be given the opportunity of trying it themselves. The foremost scientist of the day, Sir William Thompson, later Lord Kelvin, gasped when he heard the voice. "This," he said, "is the most marvellous thing I have seen in America!" A visiting Japanese, Mr Issawa, asked whether the machine spoke Japanese as well, and was delighted to be shown that it did.

This first telephone consisted of an electromagnet with an armature connected to a flexible diaphragm, and the device served as both transmitter and receiver. The vibration of the thin diaphragm in response to vibrations of the human voice caused a fluctuating



current in the coils around the magnet. This current could be made to affect the electromagnet at the receiver, so the receiver's diaphragm vibrated exactly in sympathy with the transmitter's. A battery in circuit improved reception over a distance, but as the device was both transmitter and receiver, had to be moved from mouth to ear, it was ill-suited to normal conversation.

Later Bell telephones, which had separate transmitter and receiver, used a more efficient "carbon granule" transmitter. In this, two carbon electrodes, one fixed, the other attached to the centre of a flexible diaphragm, were separated by granules of carbon. Vibration of the diaphragm with speech moved the front electrode and altered the resistance of the carbon granules—the more compressed they were, the less resistance they offered to the flow of electricity—so that a current, passing through them from a battery, altered hundreds of times a second, and made the receiver diaphragm move in sympathy.

Bell was right. The telephone was soon "laid on to houses, just like water or gas". Without it, much of modern life would be impossible. Quite apart from the world's network of telephones, in homes, hospitals, offices, fire-stations and so on, there is the equally complex and more universal distribution of radio and television receivers, and the stations which provide their programmes. Vast strides have been made in studio equipment but the principle behind every one of the world's microphones, loudspeakers or headsets—without which radio as we know it would be impossible—is Graham Bell's.

Though it is reasonable to assume that had Bell not existed, someone else would, rather later, have invented something to do the same job.

From Bell's first arrangement of two "telephone stations" five hundred feet apart, able to converse only with each other, the system expanded to embrace a manual "exchange" which enabled an operator to put a "subscriber" through to any one of many others. Before long the manual exchange began to give way to automatic ones in which the subscriber by operating a dial attached to his instrument could select any other subscriber without human intervention. Now it is possible to dial not only subscribers in the same district but telephone users in many other parts of the world.

Amplifiers have made it possible for the feeble fluctuations of the human voice to travel unlimited distances; it is no longer necessary to have the superbly produced, stentorian roar of a Graham Bell to be heard.

A distant cousin of the Multiple Telegraph which Bell was working on when he stumbled into "electric speech" now makes it possible for the same ordinary pair of wires to carry up to twenty-four simultaneous telephone conversations, each completely separated from the others, with no possibility of eavesdropping. The rather more sophisticated "co-axial" cable (still only a pair of conductors, but arranged one inside the other, with a common axis) can now carry many hundreds of conversations at once. The great majority of telephone cables are now laid underground, though in the early days of the century big cities like New York were festooned with overhead wires.

One simple but important innovation since Bell's earliest work is the use of a buzzer or a bell (and sometimes a light) to attract attention. In the earliest days the only indication one had of an incoming call was the impatient tapping of the man or woman at the other end, banging the instrument with a pencil.

Like many other inventors, Graham Bell was slow to derive profit from his work. Everyone who tried out the telephone was fascinated, thrilled, delighted; no one would consider the mammoth undertaking of stringing sufficient wire sufficiently far, with an exchange and instruments, to make it a commercial proposition. Then—as in the case of the Wright brothers and their first aeroplane—it was England which pricked up its ears, asked Graham Bell to return and consider beginning a Post Office network. Until this happened, the only money he made with his telephone was from a series of lectures he was asked to give all over America.

When the G.P.O. in England asked him to design them a telephone system, his future father-in-law relented and allowed him to marry Mabel. Their honeymoon was spent in England and Scotland. Though Graham Bell was delighted to be back in his native land, to show it off to his young and beautiful wife, he had become too much of an American to want to stay there permanently. A few months was sufficient before he went back to Boston, and in 1882 he became a United States citizen.

The British climate—particularly that of London, where the Bell family had settled to be near the Professor's work—has much to answer for. Not least, perhaps, for having driven the future inventor of the telephone away, to be delivered of his brainchild in America.

## *The Invention of the Internal Combustion Engine*

### *The Beginnings of Mechanical Transport for the Millions*

SILENTLY, too engrossed to jeer, the small boys watched him. It was a warm summer's day, a soft breeze was rolling in from the vineyards across the Neckar. Bad Cannstadt was at peace; the year was 1885.

Yet, somehow, even the street urchins, anxious to disturb it themselves, were aware that this was about to be shattered, and for ever.

Bicycles were common in Cannstadt, but they were expensive and this particular one looked more expensive than most. The crowd—it wasn't entirely small boys, their elders were wandering up to the top of the hill, the steep slope up from the River Neckar—was arriving as if by accident; no one would admit having walked any distance to see a middle-aged gentleman try out a bicycle.

And suddenly, Herr Daimler was off. With considerable agility for a man of over fifty, he ran a few paces with the bicycle, holding it by the handlebars, and as it began to nose over the hill, hopped on board, began to pedal. Then the small boys and their elders could see him lean down to fiddle with the "engine" he had bolted to the frame.

He stopped pedalling.

With the noise of a hundred firecrackers and an explosion of deep blue smoke which all but obliterated machine and rider, the engine started. There was a confused cheer from the small crowd—confused because no one was sure what was happening. The bicycle had started off downhill by gravity and pedals; it was still going down, in the middle of its private cloud, but now to the accompaniment of a truly frightening noise and at a frightening speed.

A minute later, Daimler was returning, ascending the slope from the Neckar, and his feet—but surely, they couldn't be?—his feet were stationary on their pedals. The world's first motor-cyclist had gone down to the river and come up—alive.

Gottlieb Daimler, whose name lives on with the Daimler-Benz firm of Germany, and a famous motor-car firm in England, has

been credited with the invention of the motor-car as well as the motor-cycle; but this is contested. As the first man, though, to use the internal combustion engine for his own transport—if only with a humble “bike”—he has earned a niche in history. From his motor-cycle he went on to make the world’s first motor-boat, to terrify innocent men and women sailing on the Rhine.

The engine he made so popular, the internal combustion engine, gets its power from fuel. Like its predecessor, the steam engine, it belongs to the group of “Heat Engines”, but it differs from the steam engine in that its fuel is consumed in the cylinder itself, with air, and the working pressure is produced by the sudden expansion of air which this causes. It can obviously be made less cumbersome than a steam-engine and it has other conveniences which have made it supplant the steam engine for many tasks. It is compact, it can minister automatically to its own needs, adjust its own intake of fuel and air; and it can start instantly, without the delay of lighting a fire, raising steam.

Probably the first internal combustion engine was made by the talented Dutchman, Huyghens, in the seventeenth century. He had already made improvements in clocks and optical instruments and was busy exploring the secrets of the universe with a telescope when suddenly he became earthbound: he had been struck—as if by lightning—with the idea of constructing an engine—which would work by gunpowder. He made it. The powder was ignited in a large cylinder under a tightly fitting piston, and this piston was forced violently up the cylinder by the explosion. Most of the resulting gas was allowed to escape through a one-way valve and the bit that remained shrank, when it cooled, so that a vacuum sucked the piston down again. In fact, of course, the piston was forced down by the pressure of the atmosphere acting above it, against the vacuum below. There is no record of this terrifying engine having a practical application; its movement must have been violent, noisy and spasmodic. But, as an idea, it was a big step forward.

Rather over a hundred years later, in 1824, Samuel Brown produced a version which did useful work in pumping water. Instead of a rigid piston plunging up and down in a metal cylinder, Brown moved a column of water by his explosion, and achieved with this method a highly effective pump. When rotary movement was required, he simply pumped the water to a height, used it to work a water-wheel. Not, perhaps, the best arrangement for a moving vehicle—though it is amusing to picture one; a huge

charabanc perhaps, with engine, water-tank and wheel at the back.

The internal combustion engine became practical in 1876 with Professor Otto's version. This had a "four-stroke" system of operation, a system which had been invented some years previously but which—until Otto—had never worked satisfactorily. The basic design of the four-stroke I.C. engine has hardly changed since Otto made it work; it provides the power for most of our cars, a proportion of our trains, ships, aeroplanes.

In Otto's system, a mixture of fuel and air is sucked in through a valve at the top, by the first, downward, "suction" stroke of the piston (which has to be performed by hand). When the piston reaches the bottom of the stroke, that "inlet" valve closes automatically, and during the second, upward or "compression" stroke the mixture is compressed, squeezed into a small space at the top of the cylinder. (This compression makes the mixture more combustible, so that a smaller proportion of fuel is needed.) At the top of the compression stroke an electric spark is introduced to ignite the mixture, and the resulting explosion forces the piston down in a "power" stroke. For the last, "exhaust", stroke the piston ascends—borrowing momentum from its power stroke by means of a flywheel and a crank, like a bicycle pedal—and drives the burnt gases out through a second valve, the "exhaust" valve, also at the top. This closes automatically at the top of the stroke. The engine is then ready for a second four-stroke cycle of, *suction, compression, power and exhaust* strokes.

As we can see, only one of these strokes provides power, and it is usual to have other cylinders connected to the same crank, their "firing order" being arranged so that the power strokes come one after the other; with a four-cylinder engine, one of the cylinders is always on a power stroke, giving a smooth impetus to the non-productive strokes of the other three.

But we must still remember, however many cylinders we decide to build into our engine: the first cylinder will still have to achieve a suction stroke and a compression stroke before it is able to fire. We must therefore rotate the engine for at least these two strokes, by hand, or as is now universal, by a small electric motor, a "starter".

In 1881, Dugald Clerk designed an engine which worked on two strokes, not four: each descent of the piston was a power stroke; only the ascending ones were non-productive. In theory, this might be twice as efficient as the four-stroke engine, but such was far from the case, and two-stroke engines have only a limited application, in the smaller sizes, for things like motor-cycles and

lawn-mowers. Basically, the "two-stroke" admits and compresses its mixture below the piston, not above (so, obviously, does it on a descending stroke), and then transfers it ingeniously through a "transfer port" to the space above, where it is ignited when the piston has returned to the top. Despite this doubled rate of power-stroking, the two-stroke engine is inefficient; the pumping, compressing, efficiency of the space below the piston is poor, and as the exhaust gases are driven out by incoming mixture, there is always some intermingling so that a small residue of useless, burnt gas remains in the cylinder, reducing the power of the explosion.

The two-stroke engine has tended to be neglected by designers, but its extreme mechanical simplicity—it can be built with only three moving parts—is a considerable asset.

All these early internal combustion engines from Otto's on were powered by coal-gas. This was convenient for stationary models, but not ideal for those intended to move, like Daimler's motor-cycle. He was therefore the first man to use a liquid—a product of petroleum distillation which he called "benzine", which we know as petrol or gasoline. Daimler's principle, of mixing a little of the liquid with a larger volume of air, in a "carburetter" and then sucking the gaseous mixture into the cylinder, is the one still used for petrol engines.

Petrol, gasoline, benzine—by any name it is fairly expensive. Many inventors tried to use cheaper, cruder, oils. None were successful until Rudolph Diesel produced his "diesel" engine, and now these cruder oils are widely used. They will not ignite satisfactorily with an electric spark, but Diesel discovered that if a great deal of compression were used—if the engine were really heavily built, and the piston were then forced almost to the very top of the cylinder, leaving a very small space for fuel—the oil would ignite spontaneously, in the heat of compression. The general practice to-day is to inject the fuel as a liquid into the top of the cylinder, just as the piston is nearing the top of its compression stroke.

Diesel engines tend to be more economical of fuel than their petrol-driven counterparts—and the fuel is cheaper—but the engine is heavy, it accelerates badly and runs roughly at low speeds. These disadvantages have to be weighed against its economy, and although it is popular for heavy lorries it has found no favour with the ordinary motorist.

As we have seen with our four-stroke petrol engines, all these various types of internal combustion engine have a major disadvantage: an inability to start unaided. The modern electric starter

is highly efficient, but it needs, for the few seconds it is running, a very great deal of electricity, and this presents problems of battery and generator which add to the weight and complexity of the engine. Another disadvantage of the I.C. engine is its narrow range of efficient operating speeds: unlike the steam engine it cannot shift a heavy load from rest, it requires a complicated system of gearing enabling it to "run fast and work slow". In a car, the efficient range of engine speeds is narrow. We can only start off from rest if we run the engine at the same speed as if we were travelling at forty miles an hour in top gear, and then engage a low one. But in this low gear the car is incapable of moving fast—the engine just can't go round that rapidly—so we must change gear, perhaps two or three times, to reach the cruising speed we want. In this way we keep the engine running at much the same speed for all gears and most speeds.

It is this need for changing gear which has restricted the I.C. engine's use for railways. A gear-box to deal safely with the huge power and torque of the engine required to move a train just wouldn't be practical, and at present diesel engines on trains are used to generate electric current which then powers the considerably more flexible electric motor. A great deal of power is wasted in the transfer. This is why many railways—including our own—have been investing a huge capital outlay in overhead wires to operate electric trains direct.

And quite probably, by the time all lines have been electrified, an internal combustion engine will have been developed, either with a new gear-box or just in itself capable of working over a wide range of speeds.

The simplest form of internal combustion engine, though the title is usually reserved for the reciprocating, two- or four-stroke, variety, is the rocket. In this, the gases of combustion escape through a nozzle at the rear and drive the rocket forward. The gases can be used, instead, to drive a turbine-wheel, and this "gas-turbine" is now widely used in aircraft and may soon be used in cars. But most designers are confident that, although there are signs that the normal I.C. engine may some day be replaced for motor vehicles (as it largely has for aircraft), it is capable of further development. One interesting and hopeful experiment has been the German rotary-piston engine; this is claimed to be but a fraction of the size of a normal I.C. engine, so that the engine of a small car could be accommodated in the glove compartment.

Certainly, in the second half of the twentieth century, we can see



that the internal combustion engine—whether or not it will be replaced—has revolutionized our lives. No modern farm could run without tractors and our lives would be difficult, at the very least, without cars, trucks and buses, the diesel trains on our railways.

If man lost the secret of the internal combustion engine, if Otto's and Daimler's work had been in vain and their secret vanished overnight, we would find ourselves in a far worse position than that of our ancestors, a century ago. They had never considered the horseless carriage, were not dependent on it. We are, and much as we may sigh for the peace, the silence of the day before the day Gottlieb Daimler mounted his motor-bike, we would find our lives unlivable without his internal combustion engine.

## *The Match Girls' Strike*

*"A New Leaf in Trade-Union Annals"*

ON A June evening in 1888 a small group of people gathered at a house in Bloomsbury for the usual fortnightly meeting of their "Fabian" Society, a middle-class Socialist propaganda and research organization with a total at that time of forty members. Founded four years previously in 1884, the Society had taken its name from the Roman commander Quintus Fabius Maximus, who was known as "The Delayer" because he fought Hannibal during the years 217-214 B.C. by harassing his armies rather than risking a set battle. The Fabians hoped to attain their own objects in a similar way, with patient intellectual argument bringing about gradual political and economic reform. Their aim was to make Socialism respectable; and "Evolution, not Revolution" was their motto.

There were less than twenty members present at the meeting, and most of them knew one another well. They included the red-bearded music critic of *The Star*, George Bernard Shaw, who was then thirty-two and had written a number of unsuccessful novels but had yet to have his first play performed; a young Christian Socialist minister, the Reverend Stuart Headlam, whom Shaw was later to use as one of the models for his character of the clergyman-husband in his play *Candida*; Sidney Webb, a quiet young bachelor at that time in the Civil Service, and working in his spare time on a book about trade unionism; Herbert Burrows, a mild-looking, studious and enthusiastically revolutionary graduate recently down from Cambridge; Herbert Champion, a retired Army officer; and Mrs Annie Besant, a handsome forty-year-old woman already famous for her power as a public speaker, and her radical views not only on politics but also on birth-control and the emancipation of women.

The Fabians had gathered that evening to listen to the reading of a paper on the subject of "Female Labour in London" by Miss Clementina Black, who was the first woman ever to have been appointed a Factory Inspector. What she said to them is no longer known, but it is probable she mentioned the girls who worked in the match factories of the East End, since when she had finished

speaking Herbert Champion struck a match with a flourish, puffed and sucked at his pipe until it was lit, and then asked those present if they knew that Bryant and May, the largest manufacturers of matches in London, paid their women workers only 2½d. a gross for making match-boxes, but gave their shareholders an annual dividend of over twenty per cent? They did not; and a long and animated discussion followed. It ended with the passing of a resolution declaring that in future members of the Fabian Society would not buy or use matches made by Bryant and May.

When the meeting ended, Champion drew Annie Besant aside. A resolution by a small and little-known society that its members were going to boycott their goods would have little effect if any on the manufacturers, he said. But why didn't Mrs Besant go into the subject thoroughly and write an article about it in *The Link*, a monthly magazine published by the Law and Liberty League and of which she was Editor? Mrs Besant thought it was an idea with possibilities. . . .

Late the following afternoon she went with Herbert Burrows, who was working with her on the magazine, down to Bryant and May's factory just off Bow Road, and they waited together outside the gates. When the whistle blew at the end of the working day and the factory girls began to stream out, some of them recognized her immediately, for Annie Besant with her red skirt and her tam-o'-shanter perched on top of her mop of dark curly hair was a well-known speaker at dock-gates and street corners in the East End. Jostling and crowding excitedly round her, few of the girls could understand what she was saying to them, for they were expecting a speech. Mrs Besant suggested they should all move away from the street to an open piece of waste land near-by; there she said she had not come to speak to them but to listen—she wanted to hear in detail about their work, and the conditions inside the factory.

Most of the girls were shabbily dressed in drab and tattered high-buttoned coats and old dresses, with kerchiefs knotted at their throats and shawls over their heads. Their boots were down-at-heel and shoddy, their faces pale and marked by poverty, their eyes red-rimmed and their hands discoloured and in many cases infected, as a result of working with the chemicals from which matches were made. But their voices were not affected; and so many of them began to talk, all at once, that Annie Besant could understand little at first of what they said. She was the first person they had ever met who was interested enough to give them a hearing; and their complaints poured out in a flood.

Legislation during the last quarter of the nineteenth century rectified many of the abuses common in industry, but had tended to be for particular industries rather than for all factories taken as a whole. As a result many of the malpractices which had been stamped out in large concerns still persisted in the "sweat shops" of smaller manufacturers, particularly in London. Trade unionism was so far confined almost entirely to the skilled trades; it offered little to, and did little for, the great mass of workers who were unskilled. The picture that Annie Besant received from the girls that afternoon was therefore one which concerned a little-known and almost completely neglected aspect of working-life. Soon her note-book was almost filled with facts and descriptions of what it was like.

When they were in work they earned regular money, even though it was not very much: their pay varied from 4s. a week for a girl of thirteen to 13s. a week for older workers with more responsibility. But it was not the smallness of the pay that was their main complaint. Much more important were the primitive conditions in which they worked at their crowded benches in poorly lit and badly ventilated work-rooms, with no proper washrooms or toilets, an irregular and often shortened lunch-hour and no place to eat their food in; and, in addition, the constant aggravation of strict discipline under bullying charge-hands. Every week nearly every girl had money stopped from her wages as "fines", for trivial offences like answering back, leaving burnt matches on the work-bench, or having dirty feet.

The charge-hands who reported these breaches of discipline were all men, and to keep their own jobs they sided with the management although they knew that levying of fines was illegal. The girls were not in any way organized amongst themselves; they stuck up for one another as much as they could, but there was little they could do to improve their own conditions, since anyone reported by the charge-hands as in any way "giving trouble" was always immediately dismissed.

Many of their complaints were, as Mrs Besant knew, breaches of the "Truck Acts" which regulated and controlled conditions of employment everywhere, and she promised the girls she would pass them on to the local Factory Inspector; she told them too that she would get her friend Charles Bradlaugh to take the matter up in parliament; and that she would make public all the facts they had given her, in her magazine. But they must do something to help themselves too, she said: they must elect among themselves a committee to put their complaints fully before the management of the factory. Only if they organized themselves in this way, and

stood firmly together, could they ensure that something would be done.

Tired but exhilarated she went back to her office in Bouverie Street to write her article; and it was published a few days later, on 23 June, in the next issue of *The Link*. Headed "White Slavery In London", it began: "Born in the slums, driven to work while still children, undersized because underfed, oppressed because helpless, flung aside as soon as worked out—who cares if the Match Girls die or go on the streets, provided that the Bryant and May shareholders get their 23 per cent?"

But *The Link* was only a small and insignificant magazine with a tiny circulation, and her words could easily have been overlooked. To make sure that they were not, Annie Besant sent a copy to Mr Theodore Bryant, one of the company's directors, and a letter asking if the allegations she printed were correct. A reply came immediately, by telegram: "Letter received this morning. Nothing but a tissue of lies. Article will receive legal attention. Bryant."

But meanwhile the Factory Inspector at Bow had lost no time in investigating some of the complaints which he had received from Mrs Besant. The fining of the girls stopped immediately, and Bryant and May issued a statement to the Press saying that it had stopped—which was of course an implicit admission of its having taken place. Three days later three of the girls who had talked to Annie Besant on the waste land near the factory were dismissed for "disobedience". Immediately she sent a letter to every national newspaper in the country, describing what had happened and appealing for funds for them; but with the exception of *The Pall Mall Gazette* and *The Star*, none of the papers published her letter. On the day after it appeared *The Star* published an answering letter from Bryant and May, denying that the girls' dismissal had in any way been connected with the fact that they had talked to Mrs Besant. She received another letter too on that same day; scrawled on rough notepaper, and written in an almost illiterate hand. . . .

"My dear Lady", she read, "We thank you very much for the kind interest you have taken in us poor girls, and hope you will succeed in your undertaking. Dear Lady, they have been trying to get the girls to say that it is all lies that has been printing, and trying to make they sign papers that it is all lies. Dear Lady, nobody knows what it is we have to put up with, and we will not sign them. Dear Lady, we hope that if there be any meeting you will let us know it. With kind wishes to you Dear Lady for the kind love you have shown us girls."

At first Annie Besant did not understand what the letter was telling her, but after inquiries she discovered that the management of the factory, hoping to be able to mount an action for libel against her as a result of her article in *The Link*, had told the charge-hands to make all the girls sign a statement saying that conditions in the factory were not as Mrs Besant described them, and they were happy to work there. The girls, as they said in their letter, refused. The next day there were further dismissals for "indiscipline".

A deputation of six girls went to one of the managers and asked that those dismissed since the meeting with Mrs Besant should be re-employed. He refused their plea; half an hour later to his amazement he looked out of his office window and saw the whole staff of the factory walking out. Two hundred girls formed-up into a column and marched from Bow to Fleet Street, where they surged cheering down Bouverie Street to Annie Besant's office, and sent in a deputation to tell her that all the girls at the factory were doing as she had said, standing firmly together and refusing any longer to be exploited by their employers.

Mrs Besant was excited; but she knew that at this moment she must remain calm. Unless the strike was properly controlled and organized, it would fail; and if it did, the match girls of the factory—fourteen hundred of them in all—would either lose their jobs or have to return to working conditions even more repressive than before. She helped them to form immediately a Strike Committee, empowered to draw up and submit to the management a complete list of the girls' demands, and to negotiate on their behalf. When they heard of it from newspaper reporters who came to interview them and ask their comments, the Bryant and May directors made blustering statements asserting that if the girls persisted in staying away from the factory "under the influence of Mrs Besant's twaddle", train-loads of girls would be brought from Glasgow to fill their jobs.

At the end of the week a mass meeting of the girls at Mile End was addressed by Annie Besant, Clementina Black, Herbert Burrows and Cunninghame Graham, M.P. "Stand firm," they were told: as knowledge of their action spread, public sympathy would be engaged. The next day *The Star* and *The Pall Mall Gazette* both opened subscription lists for a strike fund, and within another day or two other newspapers were paying attention to the strike, and giving publicity to the working conditions which had caused it. The match girls marched to the House of Commons, and a deputation of twelve was received in the Lobby by Cunninghame Graham

and other M.P.s; in front of them and the assembled Press reporters one of them, a thin and undernourished girl of fifteen, pulled her shawl from her head. She was nearly bald; and this demonstration of the effects of working with chemicals in confined and insanitary conditions, wrote a newspaper reporter in his account next day, "profoundly affected all who saw it".

As the Press publicity increased, so did the flow of public subscriptions to the Strike Fund. Under Mrs Besant's guidance, the girls formed a properly constituted trade union, and soon the London Trades Council took up their case for them and approached the employers, demanding that they should negotiate. In the face of such obvious and growing public sympathy for the girls, the directors of Bryant and May capitulated; all the conditions for returning to work were accepted in full, and it was also agreed that regular consultations should take place between the newly formed union and the management so that further troubles could be avoided before they became serious. "The victory of the match girls", wrote *The Star* in its leading article the next day, "is complete . . . and one feature which will make it a turning-point in the history of industrial development is the part which public opinion has played."

A few years later, when Sidney Webb and his wife Beatrice completed and published their great *History of Trade Unionism*, they referred to the match girls' victory as an incident which "turned a new leaf in trade-union annals. It was a new experience for the weak to succeed—and the lesson was not lost on other workers."

It certainly was not. Within the following year there were successful strikes for better working conditions and higher wages among the cigarette-factory workers, the employees of the London Tramway Company, and the London gas-workers, the unrest culminating in the great Dock Strike of 1889, which finally established permanently the power and rights of trade unionism in England. The great mass of unskilled workers in ever-increasing numbers formed themselves under skilful leaders into organizations which protected their rights and their dignity as men; and as their unions grew in strength and gave the workers a voice, so political action on their behalf came to be recognized as necessary, and led to the founding of the Labour Party. The idea that every man was worthy of his hire, and had the right to civilized working conditions was a new one at the end of the nineteenth century; but it grew and spread, through parliament and books and the Press, into the public conscience.

# *The Discovery of X-Rays*

## *Man Sees Through Solids*

WILHELM CONRAD RÖNTGEN was Professor of Physics and Director of the Physical Institute in Wurtzburg in Germany. He was an impetuous man with little time for the complicated apparatus in which many of his colleagues indulged. For real research, a physicist should be able to make anything he needed, with his own pocket-knife, little else.

In the autumn of 1895 he embarked on a series of experiments. True to his principles, he had made the apparatus himself, in his laboratory—though perhaps with the occasional help of tools more advanced than a pocket-knife. There was the large coil of wire, wound by his own hands, thousands upon thousands of turns of fine wire, which could raise the pressure, the voltage, of electric current from his home-made battery; there was his own version of the vacuum-tube invented in England by Sir William Crookes. This was a piece of glass blown into the size and shape of a vegetable marrow, with metal electrodes sealed into it. The glass was emptied of air by a pump—also home-made—and then Röntgen connected up his battery, through the coil, to the two electrodes, whose ends projected outside the tube.

Crookes had shown that a stream of electrons could be attracted away from the negative electrode, in such a vacuum, made to hop across a considerable space to the positively charged electrodes some distance away. The two electrodes, negative and positive, had been given, respectively, the names "cathode" and "anode". The behaviour of these electrons—"cathode rays" as many now called them—was fascinating to scientists. Among other things, the rays had the property of making certain substances glow in the dark, if they chanced to hit them. But as they seemed able to move only in a vacuum, no one could think of a practical application.

Röntgen switched on his apparatus as usual.

Then, to his astonishment, he noticed a large crystal, which he had absent-mindedly left on a corner of his work-bench, light up as if someone had lit a small fire inside. It was a crystal of one of the



substances which, placed against the glass of a Crookes tube, could be made to glow feebly. Now it was shining brightly—a foot away from the tube.

Puzzled by this, Röntgen tried sealing the tube in thick black paper; the crystal still glowed, just as brightly.

Next he ground up the crystal in his mortar, spread the grains on adhesive-covered paper. The paper, when he held it upright, glowed like a sunlit window.

Cathode rays—which were believed, as electrons, to be solid particles—could never have behaved like this; Röntgen decided he had struck a new form of radiation, some wave-form, like the electro-magnetic waves of light and heat. He was a careful man in this sort of thing, knew that his research into the phenomenon was just beginning, and he called his discovery, simply, “X-rays”—the unknown quantity. The name has stuck, though now we know a great deal about them. In some parts of the world, in honour of their discoverer, they are called Röntgen Rays.

Wilhelm Röntgen soon found that they had the interesting characteristic of being easily blocked by certain objects, not at all by others. The bones of the hand, for example, seemed to block the rays entirely, yet they passed through the surrounding flesh as if it were not there. He discovered that they exposed photographic film, just as did visible light, and now if he put his hand on a covered photographic plate (covered, so light would not reach it) and directed X-rays on it, he found, when he removed the covering, a picture of the hand on the photographic plate. But it was not the usual hand, the one he knew; it was the hand of a skeleton. The bones were clearly visible as white lines, the flesh around them grey, the rest of the plate black. A ring on his finger showed as a white band.

This seemed to Röntgen to hold some possibility for the medical profession, though he doubted if it would be possible to take useful photographs of bodily organs. Bones, yes, but not organs, which had much the same density as the flesh around them.

In fact, it was soon possible to investigate almost every part of the body with the aid of these X-rays. As machines for making the rays grew better, more efficient, than Röntgen's home-made coil and tube, and as the quality and speed of the film was improved, it became possible to study the condition of, say, the lungs, detect traces of injury, abnormality. The heart in the middle of its sharply defined rib cage could be seen clearly; any alteration in its size could be noted. The stomach and intestines presented problems, because their walls were thin and offered so little resistance to the X-rays.

Then someone persuaded an unfortunate guinea-pig to drink a solution of powdered lead and found that the outline, the shape, of the animal's digestive tract was clearly shown in an X-ray photo: the rays were blocked by the lead.

Lead is poisonous to human beings—and to guinea-pigs—but investigators found that barium and bismuth, which are not, served the same purpose. Now, before any X-ray examination of the stomach or intestine, the patient is given a "barium meal" which delineates the whole of the digestive tract, showing any blockages.

By the principle of Röntgen's sheet of paper with powdered, "fluorescent" crystal glued to it, we can now, if we wish, view the organs of the body without help from a camera. If X-rays are passed through the body and allowed to strike the back of such a fluorescent sheet (made nowadays of glass) we can stand in front and observe, turn the patient sideways, back to front, get the clearest view of what we want to see.

Röntgen proved that X-rays were not identical with cathode rays, were produced by them, a secondary effect, when they hit the wall of the Crookes tube or bounced off its positive electrode. By designing this "anode" so that it presented an oblique surface to the stream of electrons from the cathode, it became possible to bounce very powerful X-rays outside the tube, at right-angles to the electron flow. If a second anode were placed behind the first, adding to its attraction, the quantity of X-rays could be greatly increased.

Modern X-ray tubes work on the same principle, but provide a source of electrons independent of the high voltage between cathode and anode; a steady, controllable, source from a small spiral of tungsten wire, heated by a small current. A constant stream of electrons—as in a radio valve—is provided by this hot metal, and the actual quantity can be regulated by altering its heat. The force of the radiation, its penetrating power, can be altered by varying the very high voltage—an electrical pressure of anything up to 100,000 volts—between this hot cathode and the positively charged anode at the other end of the tube.

X-rays, as Röntgen maintained, are electro-magnetic waves, identical in character with light, but of far shorter wave-length. Their peculiar property is caused by the fact that they are so small they can squeeze between the individual atoms of most substances. Visible light, being "larger", cannot do so. Apart from their immensely valuable rôle in releasing secrets of the body's interior—the interior of anything—X-rays have important applications in therapy. They are widely used in the treatment of cancers because it

has been found that they damage, destroy, the cells of the body—but tend to affect malignant, cancerous, cells much more than healthy ones; a convenient and valuable phenomenon. Apart from their use against cancer, X-rays have been found to be highly effective against certain skin conditions like ringworm.

The most deeply penetrating X-rays are those of the shortest wave-length, and these are essentially the same as the "gamma rays" emitted by radium. Both sorts are used in therapy and to a large extent they are interchangeable. The same unit of dosage, the "Röntgen", is used for both. It has now been found that radium is by no means the only "radio-active" substance: others can be made radio-active, emitting radiations at varying rates and of varying power, and these have opened up whole new fields of research. Radio-active substances can be used, not only to make hydrogen bombs, but to investigate the human body, to trace industrial processes from start to finish, detect errors. Radio-active cobalt, a highly lethal substance, is now being widely used in radiation therapy, and the original X-ray tube of Wilhelm Röntgen has been so improved that rays of a penetrating power undreamed of only a few years back are now freely available.

The most rapidly expanding application of X-rays is in industry. Whenever it is necessary to investigate the structure of a finished article without damaging it, X-rays are used. Hidden fractures in metal castings can be spotted instantly, and the items rejected before any expensive further work is done on them. Faulty golf-balls (the X-ray machine can tell us at last whether they or we are responsible for a bad round), bad glass, fake gems, all can be detected by the camera. Paintings which have been altered, bogus "Old Masters" are spotted instantly under its penetrating gaze.

Unfortunately, none of the early experimenters with X-rays—or with radium—realized that exposure of the skin to them would produce, over a period of time, such dangerous burns that even cancer—the disease it was hoped the rays might conquer—could result. Many of the pioneers of X-ray succumbed to cancer and many who survived had to have fingers, hands amputated. The effect of the rays was slow, misleadingly slow, and men and women went on working unprotected for years before the first symptoms appeared—by which time it was too late. The same happened with the pioneer of radium, Madame Curie, who died of "radium poisoning".

At the outbreak of war in 1914, Wilhelm Röntgen was Professor in Munich. He was ennobled at about this time, by the Bavarian

Government, was able to use the coveted "Von" before his name, a distinction corresponding to an English baronetcy, but his health and that of his wife—famous because his X-ray photo of her hand, far better than the accidental one he made of his own, is the first preserved X-ray photograph—began to suffer. He was an ardent patriot, prayed nightly that God would destroy the enemies of Germany, but somehow seemed unwilling to take any practical steps to help Him. In France, Marie Curie was driving her X-ray van furiously a few miles behind the front line, using one of Röntgen's own tubes to investigate wounds, performing miracles not only for French soldiers but for German prisoners as well; but by now Röntgen was an old, tired man. He became a complete recluse. He had obtained his share of the world's honours, they included the Nobel Prize for his discovery, in 1901; he was content to let others use, develop, his rays.

He survived the war, still a recluse, shunning any sort of publicity, but quietly working on important research—the electro-magnetic rotation of polarized light, the ratios of the specific heats of gases, the conduct of heat through crystals—until he died in 1923.

Röntgen's discovery has revolutionized so much that we can hardly list it. Medicine and surgery were the first sciences to feel its impact, but within a few years this discovery of a lump of crystal glowing on a work-bench had upset the whole of physics. It was not until Albert Einstein and his even more revolutionary theory of Relativity that it received another such shock. Hospitals, laboratories, factories now gleam with huge successors to the original Röntgen equipment, so painstakingly made by hand, and though their performance is far superior to the first feeble burst of X-rays in October, 1895, that experiment lit up whole new regions for man to explore.

## *Marconi Sends the First Wireless Message*

### *A Revolution in Man's Ability to Communicate*

IT HAD taken over a year to prepare the massive aerials and the cumbersome, infuriatingly fragile equipment that went with them—and there was setback after setback. The two-hundred-foot masts were smashed to matchwood in a gale, shorter ones proved inadequate, kites seemed the answer. Then they, too, blew away. Eventually, however, the massive arrays were ready in Cornwall and, 2,100 miles away, in Newfoundland. In the middle of an icy night, Marconi in Newfoundland, huddled over his receiver, was able to hear the three dots, faint but unmistakable, of the Morse code letter “s”. The first “wireless” message had been sent across the Atlantic: from now on, distance would be annihilated; man would be able to speak with man, nation with nation, from the uttermost ends of the earth.

The achievement was immense: the idea was old. Clerk Maxwell had predicted the whole thing in his 1873 *Theory of Electricity and Magnetism*, which proved that “electro-magnetic waves” were set up by any oscillatory electric current, that is to say, a current that repeatedly changed its direction. These waves, he said, were similar to waves of light and travelled at an incredible speed of 300,000,000 metres—or 186,000 miles—per second. He predicted that they would some day be detected or “received” at a great distance. Fourteen years later the German, Heinrich Hertz, demonstrated to a delighted audience that the waves could be generated by a spark, leaping across a narrow gap, and that the waves would produce a smaller, sympathetic spark across a gap some distance away.

In England, Oliver Lodge, working at much the same time as Hertz, developed the “coherer”, which had been discovered by Edouard Branly in Paris. Branly had shown that a container full of metal filings, if placed in the path of these waves, would cohere into virtually a solid bar of metal, a conductor capable of carrying electricity. Lodge found that an electric current from a battery could in effect be switched on by the waves, if it were passed through such a coherer, and that this current could be used to ring a small bell.

Lodge solved one of the coherer's chief disadvantages by placing the electric bell so its clapper struck the glass side of the coherer; with the earlier experiments, once the device "cohered" and permitted current to flow, it was impossible to stop that current without disconnecting the battery—the stopping of the electro-magnetic waves didn't "un-cohere" the filings. With the bell's clapper striking their container, the filings were continually being shaken apart, then reassembled by incoming waves. When the waves stopped they remained loosened and no current flowed. It was now possible, by switching the wave-source—the "transmitter"—on and off, to produce a similar on-and-off effect at the receiver and by means of it to send the letters of the Morse code.

But the coherer had many disadvantages and it was left to others, among them Marconi, to develop a more sensitive and reliable receiver from a magnetic needle which flickered in time with the incoming waves. It could be read quite simply by eye: a brief deflection was a "dot", a longer one was a "dash", and with a little practice it was easy to make out the separate letters of the code from the singleton dot of the letter "e" to the ponderous two-dashes one-dot one-dash of "q". By attaching a pen to the needle a record of the message could be kept on a moving strip of paper. Then Marconi found he could simplify the reading of the message if he used the needle, like a switch, to open and close a circuit which would ring bells, sound buzzers, light lights.

Guglielmo Marconi, the man who made possible wireless telegraphy, and hence broadcasting and television, was born on 25 April, 1874—a year after Clerk Maxwell's prediction. He soon developed an interest in electricity and began to experiment in the family attic in Bologna, playing with wires and batteries among the silkworms. His Irish mother seemed somehow to realize her son might produce a valuable invention from his piles of home-made equipment. His father, Giuseppe, deplored the time spent on "childish experiments", destroyed every bit of electrical equipment he found in the house.

After the details of Lodge's coherer had been published, the young Marconi set himself to improving it. Night after night he sat in the attic of the Villa Grifone and experimented with different shapes of container, different proportions of zinc and silver filings, different quantities. From the coherer, he progressed to a magnetic detector and with the help of his older brother Alfonso he sent and received messages from one end of the attic to the other, from the attic to the far end of the garden, across two fields.

## MARCONI SENDS THE FIRST WIRELESS MESSAGE

All of this was encouraging, but suddenly he realized that if the phenomenon of wireless telegraphy were to have much practical use the waves from the transmitter would have to go round or through buildings and hills. In fact—and here Marconi was looking, as he always did, into the future—the waves would have to follow the curvature of the earth, or they would get as far as the horizon and disappear into space. The two brothers had been using a visual system of return signalling, with Alfonso waving a handkerchief to tell his brother up in the attic whether he had read the message; for this next experiment, visual signalling would be useless. Guglielmo gave his older brother a hunting rifle and told him to go with the receiving apparatus to the far side of the hill behind the house.

Alfonso's walk over the rim of the hill, carrying heavy equipment, took twenty minutes. Guglielmo watched from his attic window until his brother disappeared.

"After some minutes", he wrote later, "I started to send, manipulating the Morse key. And then, in the distance, a shot echoed down the valley."

And so, in September, 1895, the first practical radio transmission was made. The boys' father was admitted into the secret and he, after seeking advice from the parish priest and the doctor, directed his son to take the invention to Italy's Minister of Posts and Telegraph. The Minister—incredibly—had no interest in the young man's discovery, and Guglielmo, hurt and disappointed, decided to take his invention to England. His mother agreed that this was the wisest move and accompanied him across the Channel. Here, English Customs officials, horrified by the wires, batteries, dials and condensers they found in the Marconis' baggage, decided the pair must be dangerous regicides, on their way to blow up Queen Victoria: after all, the French President had been assassinated only two years before. Eventually mother and son, almost in tears, convinced the officials that they were only harmless visitors with a new invention—but by this time the invention had been wrecked, the packing cases were full of torn wires, broken batteries, twisted dials.

Annie Marconi's brother Henry met them at Victoria Station, consoled them and arranged their accommodation, after which he dashed round London assembling the materials with which his young nephew might rebuild the smashed apparatus. Cheered by this kindness, Marconi set to work, harder than before, and by July of 1897 was able to lodge at the Patent Office in London a complete specification for "Improvements in Transmitting Electrical Impulses and Signals and An Apparatus Therefore". He received "Patent

Number 12,039, to Guglielmo Marconi of 71 Hereford Road, Bayswater, in the County of Middlesex”.

The Chief Engineer of the Post Office, an elderly, kindly, Welshman called William Preece, now took an interest in the young man's invention and soon Marconi was using Preece's laboratory to mount an exciting experiment from the roof of the Post Office in St Martin's Le Grand to the Savings Bank Department in Queen Victoria Street. The signal passed through masonry walls on its way, yet was picked up loud and clear. Eagerly, the Post Office urged him to conduct more demonstrations and soon on Salisbury Plain he sent signals a distance of ten miles. Then, to the amazement of his audience, he sent a message across the Bristol Channel.

The Royal Navy became interested and at last the Italian Government, hearing rumours of the wonderful things the young man from Bologna was doing abroad, asked him to return. Guglielmo was delighted to do so and performed a number of experiments at the naval base of Spezia, establishing contact with ships across ten miles of water. The Italian Government now urged him to make his home in Italy, but with his own "Wireless Telegraphy and Signal Company" just formed in England, this was out of the question. He agreed, however, to change its name to the unmistakably Italian, "Marconi's Wireless Telegraphy Company".

For years—from the days of the attic in Bologna—he had dreamt of sending a message across the Atlantic Ocean and in 1901 he was able to do so, sending the letter "s" from Cornwall to Newfoundland. (Why "s"? Simply, Marconi explained, that one dot might be accidental, an interference from the earth's magnetic field, or from distant lightning; so, conceivably, might two. But the three dots of the letter "s", repeated at regular intervals, these would be unmistakable.)

From now on development was rapid. In Britain, Fleming invented the thermionic valve, utilizing the discovery that a heated wire or "filament" would give off negative electrons which could travel through a vacuum and be picked up by a positively charged plate. The electrons could only travel in this one direction, from filament to plate, and thus Fleming had hit upon the first one-way circuit. By connecting a receiving aerial to Fleming's valve in such a way that the minute oscillating current which came down it, changing direction thousands of times a second, became a direct current, fluctuating, but always in the same direction, the current could be used to perform various tasks. Two years later, in 1906, the American Lee de Forest added a third part to the valve, a grid of



wire mesh which he interposed between filament and plate, making the first "triode". This remarkable device not only converted feeble alternating currents into direct, but amplified them many hundreds of times, thus greatly increasing the range of wireless communication. A little later it was discovered that the same triode valve could be used to transmit waves, in place of the inefficient spark gap.

The next two developments, in which Marconi played a large part were the "tuning" of transmitter and receiver to the same frequency of oscillation and the "modulation" of the wave so that it would carry, not just on-and-off signals, but speech and music. The first enabled transmitters to be set up independently, working on different frequencies and not interfering with each other: receivers could be tuned to each or any of them. It also greatly increased the power of the signal. The second development made possible not only broadcasting but—some years later—television. De Forest's valve was used for this modulation, by which the slower pulses of a musical instrument or a voice (middle "A" for example has a vibration of 440 times a second) could be impressed on the rapid vibrations of the wireless wave (of the order of hundreds of thousands, even millions, per second). At the receiver, the wireless wave, now christened a "carrier wave", would be jettisoned and only the superimposed information used. A loudspeaker could be made to vibrate in sympathy with it, reproducing the sound of the original.

A major discovery for which Marconi is almost entirely responsible is long-distance short-wave transmission. He proved that the shorter radio waves did not, in fact, cling to the surface of the earth, but that most of their power shot off into space. This apparently discouraging property was of immense value: it allowed the waves to be reflected off layers in the atmosphere, returning to earth hundreds of miles from their point of origin, unweakened by absorption into the earth. By working out an angle of projection mathematically, it was possible to arrange that a short-wave beam returned to earth at a predestined point and bounced off again to return second, third, fourth and further times till it had girdled the earth. And by beaming the signal, rather than letting it scatter in all directions, as with longer waves, there was a huge saving in the power required.

The principle of short-wave transmission, on which all international radio communication depends, was developed further, with shorter and shorter waves and higher frequencies. (From Clerk

#### MARCONI SENDS THE FIRST WIRELESS MESSAGE

Maxwell's wave-speed figure of 300,000,000 metres a second we can see that a frequency of 100,000 cycles of waves per second must give each one a "wave-length" of 300 metres; a frequency of 10,000,000 cycles per second would give a wavelength of 30 metres.) The very short waves, it was discovered, could be directed like a beam of light and picked up again when they bounced off an object: the discovery on which radar depends.

Guglielmo Marconi, who did more than any man to develop radio, died in 1937. By that time he had seen his brain-child grow from a wriggling needle in an attic to a world-wide system of communication and a world-wide means of entertainment. There were broadcasting stations in every country in the world; only a few months before he died, the world's first television service, developed by J. L. Baird from Marconi's short-wave studies, went on the air in Britain.

Much of the enormous post-war development of radio communication might have been forecast by Marconi. Probably the change he would notice most is the use of "transistors", little crystals which perform most of the functions of the thermionic valve but are minute in size and use tiny quantities of electricity. The modern "transistor portable" is an accomplished, only too noticeable, fact and its small components, developed only since 1948, have made complex mathematical computers, using tens of thousands of circuits, a physical possibility.

## *The Discovery of Radium*

### *A New Weapon Against Pain and Suffering*

"26TH DECEMBER, 1898: The various reasons we have just enumerated lead us to believe that the new radio-active substance contains a new element to which we propose to give the name RADIUM."

"5th January, 1899: Irene has fifteen teeth!"

Two entries in the same hand, the hand of a young Polish woman living happily—though not without twinges of nostalgia for her beloved Poland—in Paris with her French scientist husband and her baby daughter. She had been fascinated by science in all its aspects since childhood. When her elder sister had left Poland to study medicine in Paris, had then married an exiled Pole and stayed there, young Marie Skłodowska made up her mind to go there too, and study science.

To save up the fare—and to see her widowed father through a spell of poverty—she took a job as governess to a wealthy family in the country near Warsaw. Her elder sister had been urging her to join them in Paris, but Marie delayed, month after month, until she had saved sufficient money to put her father on his feet and to get to Paris without arriving as a pauper. Then she wrote:

"Now, Bronya, I ask you for a definite answer. Decide if you can really take me in at your house, for I can come now. I have enough to pay all my expenses. If, therefore, without depriving yourself of a great deal, you could give me my food, write to me and say so."

And Bronya, overjoyed, wrote back, urged her to come at once—but to bring bedclothes, towels, mattress, stout shoes and both her hats.

Marie came, moved in with the gay and hospitable Dluskis, her sister and brother-in-law, joined the milling international crowd of students at the Sorbonne—though she was far too shy to mix with the French ones. She was upset on finding that the French on which she had prided herself as a governess was not up to the demands she now made on it as a student: she found herself

misunderstanding, failing to comprehend, whole sentences in the lectures; as a result, much of the time she should have been studying lecture-notes was taken up in learning the language. And this was made more difficult by her devoted, gay sister and her husband. In their home, night never fell; the house rang with music and laughter, or the late-night arrival of Casimir's patients, for almost every hour of the twenty-four. She had set her heart on two Master's degrees, in physics and in mathematics, and at last, in order to get the time, the environment, in which to master the subjects, she was forced to leave her sister and move into a bleak, depressing room at the other end of Paris.

And here she achieved her ambition—only to have it succeeded by another. As soon as she had obtained the degrees, the Society of National Industry ordered a study from her on the magnetic properties of various steels. Her own tiny laboratory was far too small for the work and the considerable quantity of equipment which would be required. When she looked round for another, she was told to contact a young French scientist, Pierre Curie, doing advanced work in his well-equipped laboratory: he, perhaps, might be able to find room for her.

She was shy—terrified—at the idea of approaching the man. She refused. A friend asked them both to tea.

Shortly afterward, they were sharing Pierre's laboratory. Not long after that they married.

They had discovered that their interests in research were the same. The German physicist Röntgen had only recently discovered what he christened "X-rays", rays which would penetrate solid objects, and now the Frenchman, Henri Becquerel, proved that compounds of the element uranium had the same property. If he placed a lump of, say, pitchblende, on a sheet of black paper, with a photographic plate beneath, the lump made an impression. The impression was feeble, but it was there. Pierre and Marie were fascinated by this phenomenon, and Marie, convinced that there was far more to be learnt about it, began at once to dig deeper. Pierre and his brother made the complex equipment for her and she set to work to catalogue, one by one, the peculiarities, the incidence of this radiation. Soon she found that it occurred with the compounds of a second element, thorium. Now it seemed to her that it required a name: she christened it "radio-activity".

Then came the major discovery. In search of other substances with the same property, she had been analysing, with Pierre's help, samples which they took from the mineral collection at the School

of Physics. She knew—or thought she knew—that her samples, to be of any interest, to show any radio-activity, would have to contain, in one form or another, either uranium or thorium. She had investigated every other known element: only these two were capable of emitting the feeble, existing radiation. But now—quite unexpectedly—she came across a uranium compound with radio-activity far, far stronger than could have been foreseen from the amount of uranium in it.

Her first, wise reaction was to assume she had made a mistake.

But no—she measured the radio-activity a dozen or more times, checked the chemical analysis of the compound and its weight. It still emitted a powerful—absurdly powerful—radiation.

Then she discovered that one or two other compounds behaved in the same way.

There could be but one answer: mixed in with these compounds of uranium there must be a small quantity of some as yet undiscovered, fantastically radio-active, element. She consulted Pierre, and for the first time since she had begun her study of radio-activity he found himself fascinated not just by the young and attractive wife who was doing it, but by the work itself. He dropped his own research and joined her.

Neither could have guessed that the search for this new element of which they were so sure, yet which neither had seen, would take not a month, not two, not twelve, but forty-five months—nearly four years. We can hardly separate the work of husband from wife, largely because they were both desperately anxious, throughout their search, to be treated as one. In one of their early reports to the Academy of Science, in July, 1898, they went to some trouble to conceal their separate identities:

“Certain minerals containing uranium and thorium (pitchblende, chalcocite, uranite) are very active from the point of view of emission of Becquerel rays. In a previous communication, one of us showed that their activity was even greater than that of uranium and thorium, and stated the opinion that this effect was due to some other very active substance contained in small quantity in these minerals.”

Throughout their joint career, cut tragically short, they were either “we” or “one of us”.

They began by investigating pitchblende. They reasoned that the new element would be in it, and they calculated, with what they hoped was pessimism, that it would be present to a maximum quantity of one per cent. (In fact, it was a millionth part.) Within a month of the start of their collaboration they were able to isolate

a radio-active substance, a new element—but it was not the one; it was not powerful enough to be. In honour of Marie's country, they called it polonium, but it was not what they were looking for; it was, they felt, largely a waste of time. And time was slipping, racing, past. Month after month went by. They had already christened their powerful, unseen element "radium"—but they seemed no nearer to finding it.

"Pierre," Marie said, "what will it look like?"

"I—I don't know. But I'd like it to have a very beautiful colour."

By now Pierre would cheerfully have abandoned the task of preparing pure radium. What did it matter? Surely the meaning of the phenomenon was more interesting than its material reality? He urged Marie to give up—and failed to shake her determination. They had found that the pitchblende they needed for their experiments was terribly, impossibly, expensive; but then "one of us" hit upon the idea of asking the Austrian government, which had large stocks of the ore, used in making glass, to let them have some of the residue after manufacture. They offered to pay for the transport of a ton of it to Paris, and weeks later, when they had almost despaired of ever seeing it, a horse-drawn waggon drew up outside their door, delivered a load of sacks, full of the dull brown ore, still mixed with the pine-needles of Bohemia.

They found that their guess of one per cent had been ludicrously wrong. The radiation was so powerful that only the tiniest quantity of radium was needed to produce amazing phenomena—yet they seemed no nearer to isolating it.

Forty-five months after they had announced the probable existence of radium they were successful. They had succeeded in preparing from this ton of pitchblende a tenth of a gram of pure radium, had succeeded in measuring its atomic weight.

At last the element which had existed for certain in their minds existed officially. It was more beautiful even than Pierre's "beautiful colour": it shone by itself, like a glow-worm.

And only now were the wonders of the new element revealed, only now were the four long years, sifting and testing their huge sample of pitchblende, really worth while. For their substance, their radium, apart from glowing in the dark, proved to have a radio-activity *two million times stronger* than uranium; it made, like Becquerel's uranium, only far more so, an impression on photographic plates through paper, cardboard, wood and glass; it made the atmosphere around it conduct electricity; it coloured any glass vessel into which it was put a brilliant mauve; it reduced the paper

in which it was wrapped to ashes and powder. And it made a host of other substances—but by no means all—glow under its influence, so that a diamond, for example, could be distinguished from a paste imitation: the diamond glowed brightly, the paste did not.

But the most important fact, the one which, alone, made the four years' work worth while: radium had the power of destroying human cells. Both the Curies suffered burns from touching the substance, even from holding a tube of it. Their friend and confidant Henri Becquerel, who was as excited by their discovery as they were, carried a glass tube of it in his waistcoat pocket and was badly burnt. Pierre, still nursing badly burnt fingers, but determined to waste no time, studied the effect of radium on animals and proved what he had begun to suspect: radium destroyed diseased cells and could be applied, its radio-activity "aimed", in such a way as to destroy them and do the minimum of damage to the healthy cells around them. It could be used to cure growths of all sorts, from ringworm to the dreaded cancer.

At last—and the Press was quick to take up the tale—the new element was useful, had more, far more, than a novelty, scarcity value. A French industrialist built a factory to make the substance, extract it from pitchblende, and he gave the Curies, for the first time since their work on radium had begun, a handsome laboratory. But they must, he urged—and their friends urged still more strongly—they must patent their discovery. They were poor people; in this way they would become rich, fabulously rich.

Pierre and Marie Curie refused to patent. Radium, they declared, belonged to the world. Such a healing agent—it was already alleviating cancers, and had been remarkably successful with less serious ailments like ringworm, which it cleared up miraculously—could not be the property of one person, even of a team.

In 1903 they shared with Becquerel the Nobel Prize for Physics. Yet, they were not happy: their lives were not their own, journalists pestered them for intimate details of their life, others grew impatient and angry that there was not, as yet, sufficient radium to go round, not enough for the sufferers all over the world who needed it. But as it took six tons of pitchblende to produce one gram of radium, this was not easy. Slowly, though, the world supply of radium mounted. In England, the Radium Institute was founded and soon, thanks to philanthropy and hard work, there was enough for all treatments needed in the British Isles.

The partnership of Pierre and Marie Curie was broken by death, when he was run over by a horse dray in a Paris street in 1906, but

## THE DISCOVERY OF RADIUM

Marie went on with her work, investigating and working with the healing properties of her radium, until she died, a victim of it, in 1934. Her last illness was variously diagnosed but proved to have been due to the effects of radio-activity over a large number of years, a serious, incurable anaemia.

It was the work of the Curies that gave mankind a first insight into the possibility of dealing with "incurable" diseases, opened up the flood-gates of research into the healing effects of radio-activity. Soon it was discovered that "hard" X-rays, of a very short wave-length, had much the same curative effect as radium. New radio-active substances—not active in themselves, but made so, transformed into "isotopes" of the same element, with varying degrees of radio-activity—are being used to-day, not only for therapy, but for scientific research. New applications are being discovered each year—and all because a young Polish woman determined to chase an elusive "thing", until it had been found.



## *Freud and the Unconscious Mind*

### *A Revolution in Our Knowledge of the Human Personality*

THREE GREAT blows have been delivered in the course of history to Man's self-esteem, his belief that he was the centre of the universe, the darling of the gods and the master of his fate. The first blow came from Copernicus who showed that the Earth was merely a speck in the Cosmos and revolved round the Sun, the second came from Darwin who proved that Man was not a distinct creation, but was descended from the animals, and the third blow, perhaps the heaviest of all, was struck by Sigmund Freud (1856-1938) who in a series of books published in the early years of this century showed that Man's self, his Ego, is not master in its own house, but driven and controlled by unconscious instincts of which in everyday life he is not even aware.

This fact is now universally accepted and it represents a revolution in our knowledge of the human personality, for whereas before Freud the thinking mind was held to be supreme, he showed that the reverse was true, and whereas at one time human behaviour could merely be observed and noted it can now to a great extent be explained. Since Freud we know not only what we do, but approximately why we do it. The consequences have been immense. There is hardly a sphere of modern life which has not been influenced by Freudian thought—sociology, social welfare, politics, the law, the family, education, the treatment of delinquency and mental illness, medicine, the arts, propaganda, advertising, entertainment and even religion. Modern psychiatry and our understanding of the human personality as both deeper and wider than we dreamed derive from Freud and it is he who has shown that its study can be carried out with something like scientific precision.

There is another reason why his work is so important. Human behaviour indeed seems unpredictable, swayed by unknown motives, no more coherent than the meanderings of a beetle, but Freud showed that it is possible to discern laws which govern people's words, thoughts and feelings and that they do not behave arbitrarily, as it might seem, but in accordance with their own inner dynamics.

In other words, he has taught us that the key of science can be used to unlock the mystery of human beings and there are thus two reasons why he finds his place in this book: firstly because he evolved a new scientific method of studying the human mind and secondly because the application of that method yielded results which compel us to revise our ideas about personality.

Freud's method was strikingly simple. As a neuropathologist and psychiatrist practising in Vienna in the last two decades of the nineteenth century he had to deal with a great many hysterical patients, that is, people whose ability to lead normal lives was severely impaired by symptoms such as acute anxiety and depression which were not under the control of their will. Ordinary conversation as a means of curing them was useless. There were emotional forces at work in them not accessible to their conscious minds. So Freud evolved the now well-known psycho-analytic technique. The patient lay on a couch, the psychiatrist sat behind him and the patient was asked to express the first thoughts or feelings, however absurd or seemingly irrelevant, that came to his mind on the subject of his troubles.

Freud did not attempt to interpret the material to the patient at this stage, but confined himself to helping him along when he got stuck, or encountered unconscious resistance, as he often did. Gradually the patient's attention would concentrate more and more on the basic source of his illness and this would happen automatically, just as iron filings are drawn towards a magnet, the magnet in this case being the highly charged emotions which, out of sight in the unconscious mind, had given rise to the symptoms.

Here lay one of Freud's key discoveries. The unconscious was nothing new to psychologists, its existence had long been assumed, but as a kind of waste-paper basket where memories were cast away and allowed to die as of no further interest. But the unconscious, as Freud discovered through his patients, was not like this. The emotions which it concealed were very much alive and they had great power, obviously, to affect people's conscious behaviour.

In the course of the analysis, then, which took place by means of "free association" on the part of the patient, aided by the doctor as necessary to maintain the flow, the origins of the hysteria were laid bare and—here was another discovery—it turned out that they always lay far back in real experiences of infancy and childhood. The child was indeed father to the man. There is no space to deal here with the nature of these experiences, but they all referred to the thwarting by parents or others of certain basic infantile drives

concerned with the gratification of sensual appetites which Freud labelled generically "sexual"—hence the common saying that to Freud "everything is due to sex."

Now as the patient fished the memory of these experiences out of his unconscious mind he would become more and more agitated, for the simple reason that infantile experiences are entirely emotional, and it was the emotions, not merely a cold recollection, which he was reviving, of frustration, for instance, coupled with rage, or acute feelings of guilt and rejection. But these emotions were originally attached to people and now, in the consulting-room, they once again became attached, this time to the psychiatrist. So there arose what Freud called a "negative transference" and this was a crucial stage in the treatment. Flattered at first to have the psychiatrist's undivided attention which he would interpret as a form of love, the patient would start the treatment with pleasurable feelings. Now those feelings would be turned into their exact opposite—hate, suspicion, grievance. Freud himself, in fact, would be seen, not as the helper any more, but as the sole origin of all the patient's troubles, until slowly the patient would come to *feel* a sense of release and to *realize* that these emotions were no longer justified in his present-day life. Then, remarkable fact, the symptoms which had brought the patient to Freud in the first place would tend to disappear.

What did this signify? Since earliest times the mentally sick or people who exhibited bizarre behaviour had been thought to be possessed by devils. Their afflictions, in other words, were deemed to come from the outside, as a punishment perhaps from heaven. But clearly this did not apply to Freud's patients who at a certain stage in the treatment had recovered spontaneously. It seemed as though their symptoms (which often included physical disabilities) had served a purpose within the framework of the whole personality. What was the purpose? Clearly to keep the emotions at bay which in infancy had been so unpleasant and disturbing that they had been "repressed" (another Freudian term) into the unconscious mind. Thereafter the symptoms had served as a kind of cork in the bottle, keeping the emotions repressed because they represented a threat to the personality.

Now all this had taken place unconsciously which showed that the unconscious possesses a dynamism of its own and behaves as it feels it must without reference to the thinking mind. This fact was induced, admittedly, from material provided by the mentally sick, but they had become sick for the very reason that they had been

denied the normal development of their sexual drives and their experiences threw light not only on the operations of the unconscious in hysteria, but also on the nature of the drives themselves.

So from the experiences of neurotics Freud was able to build a comprehensive theory about the human personality. He said, in effect, that we are lived by our unconscious and its instinctual drives in the sense that they determine all human activities, including those of the adult. These drives are sexual in nature and obtain their energy from a fundamental source which he called the Libido. But we must remember that to Freud sex was not merely adult sexuality, the sense in which we usually understand it, but an instinct which seeks "pleasure from zones of the body". Thus in infancy the child obtains gratification through the mouth and that is called the oral phase. This is followed by an anal phase when the child finds pleasure in the movement of its bowels and then interest is transferred to the genital organs. All this happens before the age of five.

A lull in childhood sexuality then occurs which lasts until puberty. But during this lull a new and perplexing set of emotions arises in boys and girls. In an almost literal sense the boy wants to possess his mother and develops acute jealousy of his father. The jealousy is combined, however, with a dawning admiration and a desire to emulate the father's strength. So develops what Freud called the Oedipus Complex, from the Greek legend in which Oedipus murdered his father and married his mother. In the girl the corresponding development in which she forms a strong attachment to her father, becomes jealous of her mother and seeks to replace her is called the Electra Complex.

Both these complexes are sustained by powerful feelings of guilt, aggression, love and hate and being so highly charged they are eventually repressed in their entirety until at puberty all the previous phases, with their accompanying emotions, are temporarily revived in that period of turmoil when adult sexuality slowly develops and the boy or girl acquires emotional attachments to members of the opposite sex. It is at this time also that sexuality becomes partly sublimated so that the individual pursues interests and activities which have nothing directly to do with sex. But whether he develops creative talents in the artistic sphere, or becomes an engineer, an accountant or a market-gardener, the energy which supplies his drive in all these occupations is basically sexual according to Freud's definition of the word.

This bare outline of Freud's theory cannot do more than indicate

its revolutionary nature, but it is enough to show why he is called the father of modern dynamic psychology which replaced the old static and mechanistic view that man's reason was the controlling factor in his life and his conduct a more or less enlightened compromise between his selfish interests and the demands of society. We can see now that these interests are in themselves impossible to define except in vague terms of personal fulfilment and that in personal decisions it is instinct and not reason which decides our choice. We are like characters trying to control a team of fractious horses and the horses are not even pulling us in the same direction.

This was another fact which Freud discovered, the dualistic nature of human instincts. The infant, for example, alternately feels love and hostility towards its mother depending on whether its needs are satisfied at once or satisfaction is postponed. Love and hate are, in fact, different aspects of the same coin and both are present in the child's mind at different stages towards both its parents. Other pairs of opposites also exist concurrently: aggression and submissiveness, a life instinct which prompts us to build and to love and a death instinct which urges us to destroy. These, at any rate, were postulates of Freud and however the conflicting urges are defined introspection convinces us that we are all ambivalent creatures with a sort of inner pendulum which swings continually to and fro.

So, to sum up thus far, Freud discovered that the driving force in human beings comes from the unconscious mind which is full of conflicting and dynamic emotions of a biological and morally neutral character. These emotions are not normally open to our inspection and there is, indeed, a mechanism called the Censor which prevents them from reaching consciousness. But they are all-powerful and derive from the stages of infantile sexuality. Despite regression they cannot be destroyed and if they develop in a healthy fashion they combine into an effective force, enabling the individual to obtain fulfilment and satisfaction from life. Otherwise, in adverse circumstances, they can wreck him with a more or less severe neurosis.

But all this refers to the individual in isolation, apart from the social influences, the accepted conventions of morality and behaviour which also affect him. Our parents, however, are not merely mothers and fathers, but members of the community and from their parents they have inherited standards which they try and pass on to us. So, according to Freud, the Ego which comprises our conscious selves is not only driven by the unconscious mind, but moulded by the

standards of society, the code of rights and wrongs, dos and don'ts which our parents are the first to teach us by their example and direct admonishment.

From the nursery upwards the whole weight of civilization, which is an artificial product based on an attempt to harness individual lives to the general welfare, is brought to bear on us so that we learn at an early age that we were not born simply to satisfy our own desires, but must integrate them acceptably in a shadowy realm consisting of other people.

This is a severe strain and for some people it continues throughout their lives, but the compulsion to conform is very strong and in Freud's view there is a mechanism in the mind, half conscious and half unconscious, which absorbs the taboos of society and sets up a kind of independent conscience in each one of us, so that in later life we apply the rules we learnt from our parents as though we ourselves had invented them. This mechanism he called the Super-Ego or Ego-Ideal because it holds up to us a picture of the social individual we feel we ought, or even we would like to be. Except in naturally timid conformists the Super-Ego is always somewhat of an intruder and in neurotic people it can become tyrannical to such a degree that all their energies are consumed in a war with themselves.

This then was Freud's new psycho-analytic approach to the human personality and the insights he achieved by means of it, which were also new. He gave us a key and showed us at least something of what lies behind the unlocked door. The figure of man which we glimpse appears extremely vulnerable in his mental equilibrium, highly susceptible to the conflicting forces which lie inside himself and to the demands of civilized community life. He can be moulded and actually helps to mould himself, but the instinctual drives can never be destroyed, and if, from the cradle onwards, his environment is hostile to their natural development and sublimation in adult life he will be a misfit, at odds with himself and society.

But there are many aspects of our present-day environment which are stunting in this way: the monotony of so many jobs, the uniformity of life, mass civilization which makes the individual feel insignificant, the aftermath of war, brutal ideologies which treat human beings as pawns in an economic game.

How can Freud help us here? Only perhaps in the negative way that he has taught us what to avoid in our organization of life, in child management, in education and in government. But we do know, or at least his theory implies, that there is only one worthwhile goal for any human being and that is to become strong and

independent in his mental as well as in his physical life. In some degree, of course, he must always conform to society and fulfil its demands, but beyond that there is no recipe for fulfilment or usefulness to others except to know ourselves and be ourselves—all else is treason to the talents we were born with and to the human race.

This brings us to a final point. Freud was a path-finder, but his theories by no means represent the ultimate in knowledge of the human mind. Many psychiatrists reject his psycho-analytic technique, though still admitting its value as a key to understanding. Other drives have been detected in the unconscious besides sexual ones, even in Freud's broad meaning of the term.

Certainly to a layman his theories seem too mechanistic and restricted to compass the mystery that lies in us all. We should not forget, either, that the unconscious which seems to be the villain in his piece because it is the source of neurotic conflicts is also the sole source of all inspiration, of Shakespeare's plays, of Mozart's music, of man's links with the Eternal. No further insights to guide humanity in its path can come except from those deep-hidden sources.

So, turning to the dynamic unconscious which Freud was the first to explore, cultivating it and respecting it, we may hope that, as with Freud's own patients, our anxieties and fears so powerfully generated by modern life may emerge interwoven, as it were, with the creative forces which will help us cope with the problems of the world. One might say that the follies and disasters of this century have sprung from a revolt of the unconscious against the artificial conventions of the previous age. May it not be that the same revolt will throw up new inspiration which will save us from ourselves?

*Note:* The complete works of Sigmund Freud have been published by the Hogarth Press of which the following are among the most important:

- Studies in Hysteria*, 1895
- The Interpretation of Dreams*, 1900
- The Psychopathology of Everyday Life*, 1904
- Three Contributions to the Theory of Sexuality*, 1905
- Totem and Taboo*, 1913
- Beyond the Pleasure Principle*, 1922
- The Ego and the Id*, 1927
- The Future of an Illusion*, 1928
- Civilization and its Discontents*, 1930
- Civilization, War and Death*, 1939

## *Man's First Powered Flights*

### *First Step in the Conquest of the Air*

"I WOULD hardly think to-day of making my first flight in a strange machine in a twenty-seven-mile wind, even if I knew that the machine had already flown and was safe—yet faith in our calculations and the design of the first machine, based on our tables of air pressures, had convinced me . . ."

So wrote Orville Wright in 1913, ten years after the first powered flight at Kitty Hawk. It had been a tense and tiring morning, full of frustrations, and bitterly cold, but at last the brothers' "Flyer" was in position. "After running the motor a few minutes to heat it up, I released the wire that held the machine to the track and the machine started forward into the wind. Wilbur ran at the side of the machine, holding the wing to balance it on the track—Wilbur was able to stay with it until it lifted from the track after a forty-foot run—this flight lasted only twelve seconds, but it was nevertheless the first in which a machine carrying a man had raised itself by its own power into the air in full flight, had sailed forward without reduction of speed, and had finally landed at a point as high as that from which it started—"

It was the morning of 17 December, 1903, and a stiff wind was kicking up sand from the dunes. Orville made the first and third flights; Wilbur the second and fourth. There were five witnesses of the four short hops, astonished local residents who had watched the brothers come back each year—1900, 1901, 1902—with wood-and-cloth gliders in which they made trips of up to six hundred feet. The one they had brought from their home in Dayton for the 1903 season was a great improvement, the Wrights felt, over its predecessors: its details, its refinements, had been tried again and again in their wind tunnel, an open-ended wooden box sixteen inches square by six feet long. Back home in Dayton they had tested, in the intervals of running their cycle shop, no less than two hundred kinds of wing: by September, 1903, when they set off again for Kitty Hawk (a sandy stretch on the coast of North Carolina, the only place, according to meteorological experts, which had ideal



winds and plenty of room) they had not only perfected the design but had made themselves an engine to power it. A number of men had experimented with gliders, but no one had tried attaching an engine and an "airscrew" to see if the machine could take off by itself.

On this fourth visit to Kitty Hawk they were beset by difficulties: a backfire from the motor twisted a propeller shaft, a sudden storm nearly removed the camp in which they were living. It was not until 12 December that the machine, with new, reinforced, propeller shafts (it had one engine, but two propellers, chain driven), was ready to fly. Then the wind vanished and the test was postponed. On the 14th, the machine stalled after three seconds in the air and damaged itself on hitting the ground. As this "flight" had demonstrated that their new method of take-off, from a wood-and-metal track on the sand, really worked, they were, according to Orville, "much pleased". They spent two days on repairs and on the morning of 17 December the four flights were made, as we have seen, in wind velocities of up to twenty-seven miles per hour.

And so the first powered flight took place. Such, however, was the hostility—hostility and disbelief—with which the reports were received that the United States Army, to whom the invention was offered, refused even to see a demonstration until 1908. At last, on 3 September of that year, while Wilbur was in France demonstrating to the French government (both French and British governments had shown interest after the first "incredible" reports, but had done little else), Orville took off from a field near Washington before a small, apathetic crowd of officers and civilians. From an eye-witness account we learn that when the plane left the ground, "the crowd's gasp of astonishment was not only at the wonder of it, but because it was unexpected—a sound of complete surprise".

When Orville descended, a minute and eleven seconds later, he was met by reporters with tears pouring down their cheeks. Yet, even now, there was suspicion, disbelief: no one who had not actually been present would believe in an "aeroplane" that actually left the ground under its own power. On 12 September, Orville, still demonstrating outside Washington, circled the field seventy-one times in an hour and fifteen minutes, reaching a height of three hundred feet, but still the Press ignored it—it was a freak, a phoney: even though reporters on the spot wired ecstatic stories, these were edited down to small paragraphs for the back page.

Then, on 17 September, Orville and his army passenger had an accident. The passenger died of a fractured skull and Orville went to

hospital with broken leg, hip and ribs. Now, at last, the Press took notice—an accident was news, flying was not—and the Wrights became front-page material in their own country: thanks to Wilbur's demonstration flights on the Continent, they were already well known in Europe. Now companies began to be formed, to manufacture Wright Aeroplanes under licence.

The idea of powered flight had exercised men's minds for years. The Royal Aeronautical Society in Britain had been established years before the Wright brothers' flights—had been formed in fact in 1866—but the chief stumbling block in the production of a practical "aeronautical machine" had been the absence of a suitable engine. Nothing was light enough. As Lord Brabazon, holder of British Pilot Licence Number 1, was to reminisce years later, "I remember talking to Wilbur Wright as to the possibility of building an aeroplane that would do a hundred miles an hour. His answer was simple, 'Get me the engine.' So it has been all the time—engine power."

Aeroplanes had been designed and even built for centuries—but they never flew. Leonardo da Vinci in the fifteenth century sketched a flying machine which, if suitably powered, might conceivably have flown, but no suitable power was available and he never made it. At the end of the eighteenth century, Sir George Cayley in England devised and published the principles on which the modern aeroplane is based. To this extent he may be considered its inventor. The basic requirements were and have remained over the years, a light fuselage, cambered wings and a tail unit consisting of rudder and elevator. In 1804 Cayley built and flew his first model glider; then, late in life (half a century later, in fact), he built the world's first man-carrying glider and made two successful flights with it.

Ten years before this, W. S. Henson, a young engineer in the lace trade in England, had published designs for an "Aerial Steam Carriage". Because of its impossibly heavy and cumbersome steam engine it never worked, but its design aroused a great deal of interest and argument in Europe. One of those most involved in the orgy of experiment which followed on Henson's design was the German, Otto Lilienthal. By the time Lilienthal was killed flying in 1896 he had proved that a man-carrying glider could be successfully and continuously flown and controlled in the air. Following in his footsteps, and using Lilienthal's designs, the Englishman Percy Pilcher had actually begun constructing his first powered machine when he was killed in a glider accident in 1899.

It was left to the Wright brothers in America to take up the

challenge. So great was the prejudice against ideas of human flight that no manufacturer would design an engine for them, or build one to their own specification, and they were forced to make it themselves. No doubt there was embarrassment among the manufacturers of the internal combustion engine—the first car-makers—when the Wright “Flyer” flew with a home-made engine. At any rate, this flight triggered off a burst of activity all over the United States and Europe: if the Wrights could fly with an engine put together in their bicycle shop—think what others might do with a powerful one, designed and built by professionals!

The French, the English, the Belgians, immediately produced “aero engines”, one of the most remarkable and long-lived being the French “Gnome”, an air-cooled, seven-cylinder mechanism that rotated about its stationary crankshaft and thus cooled itself. As the “Gnome” grew bigger, and the whirling, gyroscopic effect of its cylinders threatened to become uncontrollable, they were anchored to the fuselage and the crankshaft allowed to rotate, as in the surviving piston engines of to-day.

In 1916 the French Hispano-Suiza came into service, an improvement on everything before, and immediately afterwards Rolls-Royce produced their remarkable twelve-cylinder “Falcon” and “Eagle” engines of 250 and 360 horsepower and established a lead in aero engines which they have maintained ever since. In 1919 a Vickers Vimy aircraft powered by two Rolls-Royce “Eagles” crossed the Atlantic from Newfoundland to Ireland with Alcock and Brown in sixteen hours. In these early days, an aero engine only had to keep the aircraft airborne, but within a few years it had become a complete power-plant, providing electricity from its generators for lighting, radio, cabin pressure pumps, hydraulic undercarriage pumps, and a host of other essential equipment. It also, as altitudes increased, had to have an automatic arrangement for restricting fuel with height, in step with the thinning air. This was followed by the supercharger, for maintaining atmospheric pressure, rather than restricting fuel. The next step was a variable-pitch propeller which allowed the engine to revolve faster for the same forward speed, in order to obtain more power for climbing—exactly as with a car’s gear-box.

Slowly the various components were improved, with intense development taking place during the Second World War—as, in a more elementary way, had happened in the First. The famous Spitfire began the 1939 War with a speed of 367 miles per hour and ended it almost a hundred miles faster.

But the greatest step forward during the war—a development which occurred too late to have much effect on the war's outcome—was the development by Flight Lieutenant (later Sir Frank) Whittle, of the jet engine. A gas turbine, consisting of a compressor for incoming air, a combustion chamber in which the air was mixed with fuel and ignited, and a turbine, similar to the larger steam turbines in ships, to drive both compressor and an airscrew, had been discussed for years, but it was Whittle who suggested that the aircraft could be more conveniently driven, not by an airscrew but directly from the high-speed jet of hot gas coming from the engine exhaust. The idea of using some sort of jet for propulsion had been considered from the days of da Vinci—hot air, men working a bellows, steam—but it was not until Whittle recognized the gas turbine as the ideal system that the idea could be developed.

The Gloster Whittle, a single-engined jet plane, was built and flown: from then on, the jet in its several forms gradually superseded the piston engine for almost all sorts of aircraft. The earlier idea of a turbine-driven propeller—the “turbo-prop”—was developed for short-range operations, as it had the advantage over a pure jet of being economical at low speeds and heights, and requiring a far shorter runway. Its chief advantage over the piston engine, apart from a startling absence of vibration, was its lightness: it became possible to hang four engines on an aircraft's wing where only two had been before, with a consequent increase in power of considerably more than one hundred per cent.

Pure jet and turbo-prop engines are now highly developed. Although improvements still take place, the main development in aircraft propulsion is likely to be the use of rockets, which, because they require nothing from the atmosphere—can fly in a vacuum—are the only means yet devised of travelling in outer space. Speeded by a “space race” between the Soviet Union and the United States, an all-out, fantastically expensive contest to have the first man on the moon—and beyond—development in this field has been extremely rapid.

And yet probably no foreseeable development is likely to have the significance of that first powered flight in December of 1903—the first time an aircraft with a man on board had left the earth, like a bird, and “sailed forward, without reduction of speed and finally landed at a point as high as that from which it started”.

## *Japan Defeats Russia*

### *The First Asiatic Nation to Become a World Power*

WHEN Commodore Perry issued his ultimatum to Japan in 1853 demanding that she should grant trading rights, his main objective was the acquisition of bunkering stations for America's new steam ships. He was not to know that by impressing the Japanese with a show of strength, he was to all intents and purposes unleashing on Asia a force of energy which has ever since troubled all that vast continent, and created in the American Pacific sphere of interest a powerful counterpoise to Washington's Oriental policies.

In the chapter dealing with Commodore Perry's mission, a hint has been given of the extraordinary transformation that came over Japan once she had digested what trading could do for her; a transformation which is without doubt the greatest miracle in the political field during the last century. The Americans could not, naturally, keep Japan to themselves, and before very long all the great European trading powers were in contact with Japan; and from these contacts Japan learned how the world of power organized itself, and was determined to participate.

The treaties signed with the United States, France and England in 1858 provoked the last-ditch stand of the old order to delay the initiation of the new. The way in which this opposition was suppressed by the great powers led directly to a diminution of the powers of the shogun, for the great barons, the Satsuma and Chosu daimio, impressed by the foreign actions began to press for a policy of Westernization. So intensive was the pressure of these powerful lords that by degrees the shogunate was deprived of its former autocratic authority. Indeed, the shogun's powers were so whittled away that in 1867 the ruling shogun, who had not long succeeded his father, resigned.

In the first month of the following year direct imperial rule was re-established, the young Emperor Meiji, backed by the southern great barons, at once beginning a programme of almost total reform. How restricted had been Japanese life under the old feudal system may be gathered from one or two of the immediate changes

that were effected. The road barriers were removed and freedom of movement assured; the farmer was now allowed to plant what crops he wished; the samurai, the warrior class, lost the right of vendetta; the class system instituted by the last great family of shoguns, the Tokugawa, were eliminated, and all Japanese were divided into three classes: *Kazoku* (the nobility), comprising the daimio and court nobles; *Shizoku* (the gentry), comprising the samurai above the very lowest rank; *Heimin* (the commoners), consisting of low-ranking samurai and all others.

Though this concession to pride of class was made, all were guaranteed equality before the law. The abolition of the former military class, the samurai, made it necessary for Meiji to develop his own armed forces, and in 1873 conscription on the German model was introduced, by which all males over twenty were liable to three years' service. The French military mission which had been sent to advise on the organization of forces was now replaced by German experts. At the same time a small navy was commissioned under the guidance of the English.

A public educational system was also introduced, and this was organized on the French system. Every child was obliged to have, at least three years' schooling, but some years passed before all eligible children were actually attending. A university system was inaugurated in 1871; the initiative was not left entirely to the State, several privately founded institutions being set up between 1875 and 1882.

As we have seen in the chapter on Commodore Perry, a new religion was also evolved, State Shintoism. The tenets of this religion are set out in that earlier chapter, but attention is once more drawn to that tenet which held that it was Japan's divine mission to bring "the whole world under one roof", a tenet which was the basis of all Japan's activities in the international field from 1880 on.

In the field of revenue, the greatest reform was the replacement of the traditional rice tax by a land tax collected in money. In 1872 the government issued certificates of ownership to those they could prove held cultivation rights. A value was set on each parcel of land, and a three per cent tax on this value was levied.

This change created much dissatisfaction among the agrarian population, for in effect the new tax took as much as 30 to 40 per cent of a farmer's crop value, which put the tax burden much higher than it had ever been under the shogunate. As a result a series of peasant rebellions broke out in the early 1870s, but petered out as the decade advanced.

Nor were the farmers the only section to be restive. Many of the samurai were beginning to feel that there was little place for them in the new order. Some of them had been absorbed into the growing bureaucracy, and some had even been prepared to launch themselves into business careers. But many could not make the change, and longed for a return to the time when the samurai would be valued once more.

These varying approaches to the new life split the samurai into two groups, of about equal numbers and strength, but the votes of the two court nobles who were prominent in the government generally gave support to the group which held that the samurai must accept a new rôle. The overall balance, however, was disturbed when a group of the progressive samurai went on a mission abroad to learn as much as they could about Western technology and institutions. While they were away the reactionary group decided that something must be done to restore the samurai to their rightful position in the nation, and that this something obviously must be war. The victim was to be Korea, which had rejected Japanese advances for treaties, though the ultimate goal was to be China. Fortunately, the reactionaries were restrained, but not until an armed uprising in Saga led the government to follow a policy of appeasement by organizing an expedition against Formosa on the pretext that the Formosans had murdered some Okinawan sailors. This created difficulties with China, but these were overcome by China eventually recognizing the propriety of Japan's actions.

The peace lasted only a few years, however, and in the autumn of 1876 samurai revolts broke out in Kumamoto, Fukuoka and Yamaguchi, and a really serious rebellion in southern Kyushu. Fortunately the central government met these tests with firmness and within a few months all was quiet again.

In 1874 political parties began to emerge, initially as political societies. This move was accompanied by demands for a representative assembly, which also had the seeds in it of trouble for the central government. By firmness on the one hand and concessions on the other, once more the government met the challenge. Although measures were introduced which effectively suppressed political agitation, the government did realize the need to establish a political structure, and a constitution was promised.

This had, in fact, been under discussion for some time. One of the leading members of the government, Okuma, was in favour of a system based on the English system, and in 1881 submitted his recommendations to the Emperor, which included the calling of a

parliament in 1883. When the other members of the government heard the nature of Okuma's recommendations they were at once up in arms, and nothing might have come of the proposals had not another issue broken at the same time.

The government had decided to sell to an Osaka syndicate the enterprises which had been established in Hokkaido to aid economic development. Okuma leaked this information to the Press, and when the public discovered that the purchase price was only a small fraction of that which the government had initially laid out, serious disturbances broke out with the slogan that the government was corrupt and that a parliament was necessary to keep it in order.

On the night of 11 October, 1881, the Emperor presided over a full meeting of the government, with the exception of Okuma, and the sale was cancelled. Next day an imperial rescript promised a parliament by 1890. The task of preparing the constitution was given to Ito Hirobumi, who spent 1881 to 1883 in Europe studying Western constitutions. Upon his return to Japan he at once began to introduce preliminary changes in the structure of the government.

In 1884 a peerage was created on the English system; in 1885 the central administration was reorganized and a cabinet on the German model introduced, with Ito as first Prime Minister. By 1888 a draft constitution was ready, and this, after some minor changes had been made by a Privy Council set up to study it, was promulgated on 11 February, 1889.

The main provisions of this constitution, known as the Meiji Constitution, were these: the emperor combined in his person all executive, legislative and judicial powers, but never exercised these powers except on advice; his primary advisers were the Prime Minister and Cabinet; the emperor's signature on a political document was not valid unless the Cabinet countersigned; the emperor chose the Prime Minister after taking the advice of the Elder Statesmen; once the Prime Minister had been appointed, the emperor accepted his recommendations for the other ministers, who had at their command all the emperor's political powers.

Certain restraints were created upon the use of these powers. A Diet was established consisting of a House of Peers and a House of Representatives. Princes and marquises sat in the Upper House for life, lower orders for seven-year periods on election by their fellow-peers. The House of Representatives was elected by popular ballot based on property qualifications. The best weapon the Diet had against the government was the right of interpellation, which might be used to take up almost any matter, but the Diet never



## JAPAN DEFEATS RUSSIA

did succeed in establishing the principle of ministerial responsibility. The new system began to operate on 1 July, 1890.

While these changes were being made industrial development had been going on at a miraculous pace, and soon Japan was aware of her new strength. With this awareness came the realization of the duty to implement the "under one roof" tenet of State Shintoism.

Shortly after the Formosan expedition of 1874, Japan began the implementation of this tenet by annexing the Riuikiu Islands. She then turned her attention to Korea, which was nominally subject to Chinese suzerainty, and in which most of the European powers were also interested. Conflicting Chinese and Japanese policies over Korea and Manchuria led to the Sino-Japanese war of 1894, with Japan emerging victorious from her first major conflict. She won Formosa, a substantial war indemnity and the recognition of Korean independence by China. She had also hoped to secure the lease of the Liautung Peninsula, but this was prevented by Russian action, aided and abetted by Germany and France. In 1898 Russia herself secured part of the Peninsula.

During the Boxer Rebellion in China in 1900, Japan sent a contingent to co-operate with the other treaty powers in the relief of the Peking legations, although she watched the progressive occupation of South Manchuria by Russia with the greatest anxiety, which was further increased by Russia's refusal to withdraw when the Boxer Rebellion had been suppressed. She now realized that before she could expand in Korea and South Manchuria she must first defeat Russia. Over the next three years she laid plans for the accomplishment of this aim.

Unfortunately there is no space here to do more than record that from the very first moment that the Russian-Japanese War broke out in 1904, Japan had the mastery. Exactly nineteen months later, Russia sued for terms. Japan's demands were humiliating, but Russia accepted them. Japan received the Russian base of Port Arthur, and took over Russia's extensive rights in South Manchuria.

By this complete defeat of a major European power, Japan automatically placed herself in the comity of great world powers. This she had done within fifty years of emerging from medieval feudalism. At the same time she had changed herself into a modern industrial state, able, because of limitless cheap labour, to undercut all her rivals. By 1905 the stage was already set for Pearl Harbour.

## *The Assassination of the Archduke Franz Ferdinand*

### *The Immediate Cause of the First World War*

EUROPE PLUNGED into a general war in 1914 after ninety-nine years of peace, since 1815, which had witnessed the end of the wars of the French Revolution and Napoleon. There had, of course, been a number of wars since 1815: Italy had had to fight for her independence; Germany had fought three short campaigns, against Denmark, Austria, and then France in 1870, before the German Reich could be made; the Turks had been driven out of Europe and the Balkan powers which took the place of the Ottoman Empire fought among themselves. Yet always the Great Powers had managed to keep these conflicts from spreading.

At first, the spirit which had guided the conservative statesmen who had settled Europe after Napoleon at the Congress of Vienna continued as the mainstay of peace. It was the duty of the sovereigns of Europe and their ministers never again to allow Europe to destroy itself, and its social order. Later in the century, this idea lingered on as "the Concert of Europe", which still, in a vague form, preserved the idea of unity. Able statesmen such as Bismarck and Disraeli could still summon up a European spirit to avoid disaster. The "Concert of Europe" by the beginning of the twentieth century had given way to a much less secure way of keeping the peace, the Balance of Power; a Triple Alliance of Germany, Austria-Hungary and Italy faced a Triple Entente of Russia, France and Britain.

Other factors increased the likelihood of war when the century began. There were fierce resentments from past wars in the Balkans and France remained unreconciled to the loss of Alsace-Lorraine which Germany, against Bismarck's advice, had taken from her in 1870. Germany, the most powerful military and industrial nation of the Continent, ruled by a neurotic and vainglorious Kaiser, Wilhelm II, resented the fact that she had virtually no colonial possessions whilst Britain and France had huge empires. Determined to win her "Place in the Sun", Germany started a naval building programme to challenge the British Navy. Britain replied by

building yet more ships. In general, all the nations, small, medium and big, were supporting ever-larger armed forces year by year. Europe was in a nationalistic mood. In the civilized countries of Western Europe, little boys wore sailor suits and their nurseries were full of toy soldiers. When war came the people welcomed it, though only in Germany was it welcomed whole-heartedly.

Nevertheless war was not inevitable. There were precedents and tried methods for solving crises in the hands of the diplomats. Wars are not made by moods, and if there was "jingoism" this was counter-balanced by great economic stability and by the growth of international feeling. Currencies were interchangeable, and you could pay for a drink in the Café Royal in Piccadilly in Greek drachmas, French francs or German marks. Passports were unnecessary in most countries. The growth of industry and trade between the nations of Europe seemed to make war unthinkable and, though there was talk about commercial rivalry overseas, the struggle for export markets was far away. The great financial and economic interests of Europe were on the whole against the idea of war. If Nietzsche and Kipling in different ways glorified force, it was also the age of Tolstoy, Ibsen, Bernard Shaw and H. G. Wells. One has to conclude that the profound universal influences making for war or peace largely cancelled themselves out. All Europe was guilty and also not guilty of allowing war in 1914. But when one looks at the way war was actually brought about it is another story.

Although during the nineteenth century many peoples had won their national existence, there were still many demands not met. The Irish problem nearly led to civil war in the United Kingdom in the spring of 1914; Poles groaned under the foreign domination of Russia, Germany and Austria-Hungary; Finland was still a part of the Czar's empire. Above all, suppressed national demands threatened the life of Austria-Hungary in which eleven subject races, including Czechs, Slovaks and Italians, all demanded, with varying degrees of determination, political liberty or another allegiance. This fermentation of revolt had created in the minds of the Austrian political leaders, and in that of the aged Emperor Franz Joseph who had been on the throne since 1849, an increasingly bellicose state of mind. It was because they believed that their cumbrous Hapsburg Empire could only be held together by force that Europe was involved in war.

The main danger which the politicians of Austria-Hungary feared came from the little Slav kingdom of Serbia, which had fought so well against the Turks in the Balkan wars and whose example

inspired so many of Austria's Slav subject peoples. Austrian diplomacy had been long exercised to crush Serbia and had successfully prevented her access to the Adriatic after the second Balkan war by creating the independent kingdom of Albania. Opportunities for totally crushing Serbia would have been seized but for the fact that Serbia enjoyed Russian protection.

The heir to the throne of Austria-Hungary was the Archduke Franz Ferdinand, an intelligent, rather authoritarian, moody, middle-aged man who, with his square head, melancholy eyes and large chin, looked a typical Hapsburg, whilst his hair *en brosse* and his upturned moustaches gave him a general resemblance to the Teutonic aristocracy and particularly to Kaiser Wilhelm. He was not popular either in Austria or Germany. His ill-humour came in part from the fact that he had married,morganatically, a Czech Countess Sophie, against his father's will, and his wife, to whom he was devoted as he was to his children, suffered thereafter from a sort of social ostracism by imperial society.

Franz Ferdinand had liberal inclinations and believed in a plan which was seriously considered in some circles in Vienna, for turning the Dual Monarchy, in which the Austro-Germans and Hungarian-Magyars formed the ruling class, into a Triple Monarchy in which the Slav subjects of the Hapsburg Empire would have an equal share. So in Serbia the Archduke was particularly disliked as a dangerous reformer who might wean away Serbs and Croats and other southern Slav people from the true ideal of a great Serbian State.

In 1908, after the third Balkan war, Austria-Hungary had annexed the large territory known as Bosnia-Herzegovina which ran down the Adriatic coast to Albania and which had been in the hands of the Turks. It was a comparatively new acquisition that in June, 1914, the Archduke and his wife were visiting, the occasion being some important military manoeuvres. Though there were many Serbs in Bosnia, the Croat majority, mainly Catholic, was counted, in Vienna, as among the relatively loyal elements of the Empire. The Archduchess, a woman of charm and character, greatly added to the success of the tour.

The royal pair had left Vienna on Tuesday and had spent four days in Bosnia, at Ilidze, a small village connected with the important town of Sarajevo by a narrow-gauge railway. One of Franz Ferdinand's A.D.C.s seems to have urged the Archduke, on Saturday, to return to Vienna and cut out the visit to Sarajevo. There had been rumours of assassination plots and the Archduke's entourage was

jumpy—so jumpy that a court photographer carrying a long flash-light tube had been arrested as he hid in the bushes to snap the Archduke and his wife as they passed.

On Sunday morning, after hearing Mass in a private chapel and sending a telegram to his children saying he and their mother would be with them on Tuesday next, the Archduke and Duchess caught the train to Sarajevo, inspected some troops and then climbed into the rear seats of a dark-green open car, General Potiorek, the Governor of Bosnia, and Count Harrach who owned the car sitting in front. The Archduchess wore a white dress with a large hat, the Duke a light blue tunic and black trousers with a cocked hat with green ostrich plumes. Other cars with A.D.C.s and senior officers followed.

Sarajevo lies at the beginning of a plain, with some high mountains behind it to the north, on the Miljacka river. An important Turkish garrison town, it had, and still has, some fine Turkish architecture and in 1914 it had one hundred mosques. The plum trees were in blossom, and a hot sun was blazing after a heavy rain when the royal couple left the station and drove down a wide street called Appel Quay which runs along the river bank to the centre of the town.

Along the Appel Quay six young assassins, all of them Bosnians, five of them Bosnian-Serbs, had posted themselves. Three of them, Princip, Cabrinovic and Garbez, had been trained by the Serbian Black Hand organization, whose object was the achievement of Serbian aggrandizement by violence. Though these three denied that they had ever been given instructions by the Black Hand and that the intention to murder the Archduke was theirs and theirs alone, it is certain that the three others were recruited by a Black Hand agent living in Sarajevo.

As the Archduke's car was moving at some twenty miles per hour down the Quay, the first of the assassins did not, from fear or surprise or nearness of gendarmes, fire. But stationed on the other side of the Quay was Vaso Cabrinovic, who lobbed a home-made bomb, the cap of which he had banged on a water hydrant, on to the hood of the Archduke's car. Franz Ferdinand had seen what Cabrinovic was doing, stood up in the car and knocked the bomb into the road, where it exploded and wounded some bystanders and occupants of the next car. Cabrinovic swallowed a phial of poison, which did not work, and jumped into the river but was soon captured. The Archduke's chauffeur drove rapidly to the Town Hall. The other assassins, one of whom was Gavrilo Princip, did nothing.

The Archduke was extremely angry and would scarcely listen to the Mayor's address of welcome. He refused to wait until troops were sent for to protect the procession of cars and decided he would not visit the museum which was the next place on his programme, but would drive back along the Appel Quay to the hospital where the injured were being treated. Count Harrach insisted on riding on the running board, choosing the left side. Had he stood on the right it is possible that he would have received Princip's bullets and that a European war might have been averted. Had the chauffeur been told beforehand of the change of itinerary, the Archduke's car would not have been halted by a bridge where the chauffeur was ordered to turn left to the hospital, back along the Appel Quay, and not right to the Museum.

It was whilst the car was stationary by the bridge and going into reverse that Gavriilo Princip, disconsolate at the failure of the attempt and waiting just in case the Archduke should reappear, was able to fire at a sitting target and from about five yards. One shot hit the Archduke in the throat, the other the Archduchess in the abdomen. The Archduchess died even before the car had reached the Governor's house. The Archduke was dead fifteen minutes later. His last words were, "Sophie, for God's sake stay alive for our children."

The world heard of the Archduke's assassination with some alarm; but little happened for three weeks, from 18 June until just before 23 July, and most of the world by that time had forgotten all about it. A violent Press campaign was conducted in Austria against Serbia, but the Kaiser had set out on one of his customary annual visits to the Baltic, the Commander-in-Chief of the Austrian and German Armies, Conrad von Hoetzendorff and Von Moltke, had gone on holiday, and so too had the German High Seas Admiral, Von Tirpitz. The French President Poincaré and the Prime Minister Viviani were on a visit to Russia and were indeed returning by sea on 23 July.

A Secret Austrian Commission of Inquiry had at once begun work; it failed to find any conclusive evidence of the complicity of the Serbian Government in the plot. In Serbia a General Election was being held, and because of this and perhaps because the Government had had wind of some plot but failed to communicate its information to Vienna, no inquiry was instituted on the Serbian side.

Until 23 July even "well-informed circles" outside of Vienna were unaware that Austria intended war on Serbia. On the whole

public opinion sympathized with the Austrian demand that Serbia should be punished for failure to control her national extremists. "To Hell with Serbia," wrote Horatio Bottomley in his large-circulation weekly *John Bull*. The terms of the Austrian ultimatum, however, caused some alarm. They amounted, in their ten points, one of which included the temporary occupation of Belgrade, the capital of Serbia, by the Austrian Army, to a demand for the abdication of Serbian independence. It was an ultimatum meant to be declined, and Austria's intention to go to war was evident. Serbia accepted seven of the ten points on 25 July. On 28 July the Austrian army bombarded Belgrade.

One event which had happened behind the scenes in those three weeks was of the utmost importance. On 5 July the German Kaiser received Count Hoyos on behalf of the Austrian Foreign Office, and, over lunch, told him that Germany stood behind Austria whatever steps she might take. Constitutionally the Kaiser was obliged to consult the German Chancellor, Von Bethman Hollweg, and this he did, though very informally, for he was in a hurry to start his journey to the north, during a walk in the Palace grounds that afternoon. German support for Austria in any eventuality—the probable one of war with Russia in the event of positive action against Serbia—was pledged. This enabled the Austrian Foreign Minister, Von Berchtold, and the war party to overcome the objections to a war policy with Serbia and Russia raised by the powerful Tisa, the Prime Minister of Hungary.

The German government was not shown the Austrian note, and when the rather surprisingly conciliatory Serbian reply was received, the Kaiser was relieved and thought that Austria had won a bloodless victory. Germany, on 26 and 27 July, was suddenly trying to put on the brakes. Even so the German government refused to support Sir Edward Grey's suggestion made on 27 July that Serbia should be given more time; Grey proposed a conference of Ambassadors of the powers not directly concerned with the quarrel—Germany, Britain, France and Italy.

By then, however, the German General Staff had decided that war was to come out of this and that it was better now than a year or so later when Russia would have completed her strategic railways. Whilst the Kaiser and the German Chancellor were attempting to moderate the Austrian attitude, Von Moltke went so far as to send a telegram to the Austrian C.-in-C., urging rapid mobilization.

On 29 July, Russia concentrated troops along the Austria-Hungarian frontier. Early on 30 July, the Czar, still in contact with

the Kaiser, who was now extremely anxious, ordered a partial mobilization of the Russian Army, but by the late afternoon the Russian General Staff had persuaded him to declare a general mobilization on the grounds that a partial mobilization was impractical and might lead the French to consider they were not obliged to support Russia in a local war with Austria. Russia, therefore, mobilized fully on the 31st and so took the first virtually irrevocable step. On that day Germany asked France if she would remain neutral in a conflict between Germany and Russia. The German Ambassador had instructions to demand the handing over of the fortified towns of Toul and Verdun as guarantees if France's answer was "Yes". But the French government answered "No" and France on 1 August decreed a general mobilization.

France was still not at war. It is possible that if the British government had announced that Britain would enter the war if France was involved, the war could have been averted. The British Cabinet was divided and so was public opinion: Britain was not absolutely pledged to support France. But whatever Britain's attitude, the die was really cast in Berlin.

Before Germany's declaration of war on France on 2 August, the German government sent a note to Belgium demanding the passage of German troops through the national territory. The war plan of the German General Staff against France, the Schlieffen Plan, consisted in the turning of the French army, concentrated on the Franco-German frontiers, on its left flank by a rapid movement through Belgium. On 1 August the Kaiser, hoping to secure British neutrality, tried to persuade Von Moltke to abandon this offensive against France through Belgium and to concentrate on the Eastern Front. Von Moltke replied that this was militarily impossible; thousands of trains were already speeding towards the West and the Belgium frontier and to alter the war plan now would simply mean chaos. Britain, he thought, would not come in.

It was the violation of Belgian neutrality, guaranteed by all the powers, that brought a now unanimous Britain into the war on 4 August. Even Von Moltke when he heard the news was abashed, for now Germany and Austria (without Italy who declined to follow their lead) had to face a powerful coalition in the West as well as the vast might of Russia in the East. The Kaiser exclaimed pathetically about his uncle Edward VII whom he had hated, "Edward dead is more powerful than I am, alive."

This story of how war actually began does enable one to pin down responsibility more closely. The unwise German Emperor



allowed the weak Dual Monarchy to believe that Germany would support it unconditionally against Serbia. The German Emperor had second thoughts but not so the German General Staff. The Czar might have delayed a general mobilization and again diplomacy might have intervened, but the Russian military leaders over-ruled him. This was the basic cause—weak, despotic emperors in Central Europe, and strong generals.

England might have made a more vigorous attempt to preserve the peace in July if her pacific-minded Cabinet had not been pre-occupied with Ireland or if she had had at that time a leader of the greatness of a Disraeli or a Gladstone. It was the tragedy of Europe that in the important countries there were no political leaders outstanding enough to control the military machines. So Europe blundered into a war which was to be the suicide of an epoch. No one, and least of all the rulers of Central Europe, had the imagination to foresee what kind of a war it was going to be or what would be its consequences.

## *The Battle of the Marne*

### *Germany Loses Her Chance of Victory Never to Regain It*

THE GREAT WAR began with the enthusiastic consent of most of the peoples in the countries of Europe. All imagined they were fighting for the Right and for Justice. Rupert Brooke's words:

*"Now God be thanked Who has matched us with His hour  
And caught our youth, and wakened us from sleeping"*

were echoed all over the Continent which was so soon to be full of misery, of dead and dying. Everyone imagined too that the war would be short, and very few people imagined that it would be a total war involving the whole population of Europe. There was confidence on both sides that the enemy could be taught a sharp lesson. And so the war began with great offensives by the principal Continental powers. The Austrians, who had invaded Serbia, advanced into Russian Poland, and, by mid-August, two huge Russian armies, badly equipped but full of a belief in the might of Holy Russia, crossed into East Prussia. The Germans violated the neutrality of Belgium and brought Britain into the war on 4 August. The French on 7 August advanced into upper Alsace and reached the Rhine on 19 August, whilst the main French offensive by the First and Second Armies advanced into Lorraine.

For some ten years before 1914, the French Ecole de Guerre and the High Command had accepted a doctrine that war was won by the nation which most resolutely adopted the offensive, and Napoleon's phrase that "morale is to the physical as three to one" had been elevated into a sacred dogma by those who constituted the brains of the French Army. Had not the Germans "marched to the sound of cannon" in 1870? At manoeuvres held before 1914, the commander who showed the greatest impulsiveness in searching out the enemy and bringing him to battle won the greatest praise from the High Command. And so at Morhange-Saarebourg on 14 August, the French infantry, still clad in the red and blue uniforms of 1870, were launched into a furious attack on the army of Prince Ruprecht of Bavaria. The attackers were shattered by the

German machine-guns and rapid rifle-fire from defensive positions, and the same story occurred in other battles along the Alsace-Lorraine Front. As happened in 1940, the French General Staff had planned to fight a war on the lines of the last war. They paid the penalty in 1914 of huge losses in the finest divisions of the French Army.

The German campaign was based on the Schlieffen Plan which consisted in the invasion of Belgium, the descent into France from the north and north-west and the turning of the French armies which were expected to be massed, and indeed were massed, on the Franco-German frontiers. The German invasion of Belgium did not at first alarm the French General Staff. The huge fortress of Liège fell after repeated attacks and the use of very heavy guns of a calibre not possessed by the Allies: but its capture had taken some time and cost the Germans 40,000 men.

The French High Command considered the German activities in Belgium were a costly diversion of German strength and that the main attack was bound to come through the Ardennes, and, harking back to 1870, once more large French forces were stationed along the Meuse where the Ardennes break down. It is strange to think that in 1940, when Guderian's Panzers began their dash to the sea by crossing the Meuse and breaking through the French Army stationed there, the French considered that this was the least likely area for a serious attack.

In 1914, the wideness of the German sweep through Belgium was not only not expected but not even noticed until almost too late. In addition to this error, the French High Command was misinformed of the total of German effectives in the West. Accepting that Von Moltke, the German Commander-in-Chief, might employ all his reserve divisions at the outset of the war, French intelligence put down the total German infantry force at 68 divisions of which they identified 45 in action during August. In actual fact the Germans employed 83. So the Kaiser's armies possessed numerical superiority over the French and the small British Expeditionary Force, "the first 100,000", which was in line by mid-August; in addition, the Germans had a war plan which the enemy had not understood, and an army trained in accordance with the increased fire-power of modern weapons, which was to show itself for a long time far better adapted to modern war than the French or the British.

Fortunately, on the Western Front the German generals made some grave mistakes. The very first one was made after their victory

at Morhange-Saarebourg, when instead of remaining on the defensive and luring the French into further advances in Alsace-Lorraine whilst the German pincer movement through Belgium was taking place, Prince Ruprecht and the Kaiser's son, the Crown Prince, who also commanded in this sector, took the offensive and drove the French back to a strongly fortified line which they were able to hold fairly easily. Later, in September, when the Battle of the Marne took place after the great French retreat from the Belgian frontier, these French armies on the eastern sector of the Front were able to spare some divisions which were sent to the Western Front, to defend Paris.

But during the last two weeks of August and the beginning of September it was not German mistakes which came to mind but rather the fact that the German armies seemed irresistible. General Joffre, the French Commander-in-Chief, realized too late the danger on his left flank, from the Germans now invading northern France. The French at Charleroi, the British at Mons and Le Cateau offered a momentary, but vain, resistance to the great flow of German field-grey soldiers.

The French general Lanrejac, whose army lay next to the British Expeditionary Force, foresaw sooner than Joffre did the extent of the German pincer movement. Unfortunately Lanrejac did not get on at all with the British commander, Sir John French. French was choleric and suspicious of the French, whom he disliked and whose language he did not speak, and was not very quick-witted in any case. Lanrejac was talkative, tactless, irascible and quick thinking. Co-operation was anything but good. Nonetheless, it was a fighting retreat, and the B.E.F. and the French Fifth Army had plenty of fight left in them.

At Guise, the French won a minor defensive battle and a certain Colonel Pétain, who was on the verge of retirement, distinguished himself. Pétain, who was an open critic of the French military school, believed that "fire-power kills" and opposed "the offensive at all costs". Within a few months, Pétain was to be an Army commander and later Commander-in-Chief of the French armies. Also in the 33rd Infantry Regiment commanded by Pétain was a lieutenant aged twenty-four called Charles de Gaulle, who between 1914 and 1916, when he was wounded and captured at Verdun, was three times mentioned in despatches.

Fortunately, during this retreat, and perhaps because of the fighting power of the B.E.F. and the French Fifth Army, the Germans never occupied the Channel Ports. There was nothing to

stop them. Uhlans installed themselves in Amiens but never penetrated as far as Calais or Boulogne. The German High Command was completely preoccupied with crushing the French Army, and presumably, since they did not think the war would be prolonged, they did not consider it worth taking the Channel Ports. The Kaiser, the supreme War Lord, a man who easily went from one extreme to the other, was hurrah-ing for victory at the time, as the German armies approached nearer and nearer to Paris. The French Government left Paris for Bordeaux.

Joffre's plan was to retreat in an orderly fashion to the east of Paris, leaving the capital to be defended by its garrison, commanded by General Gallieni, and a Sixth Army which was slowly being formed under General Manoury and made up of divisions brought from the eastern end of the French Front. By the beginning of September, Joffre had not made up his mind where he would turn round and stand and fight.

The Battle of the Marne which now took place has aroused more controversy than any other battle in history. Whilst there was very heavy fighting along the whole front from the Rhine to Paris, the key events of this battle took place to the immediate east of Paris where the B.E.F. and the French Army were still retreating in order to come more or less in line with the rest of Joffre's forces. On the German side, the army on the eastern German flank, commanded by Von Kluck, had outpaced its neighbour, the German Second Army, commanded by Von Bülow; apparently on his own initiative Von Kluck wheeled south-east and away from Paris, following the retreating French and British forces. It was not according to the German war plan which envisaged the investment of Paris by a part of Von Kluck's army and a sweep right up to the capital.

The German Commander-in-Chief, Von Moltke, who had moved his headquarters no nearer to the battlefront than Luxembourg, was out of touch with the generals commanding the armies in the field, but apparently gave his consent to Von Kluck's manoeuvre on 4 September. It was then that General Gallieni in Paris realized that now was the moment to attack the exposed German flank. After much telephoning and argument with Joffre, he obtained consent that part of General Manoury's army should proceed to the offensive.

The German gap between Von Kluck and the German Second Army was enlarged, on 5 September, due to the fact that the B.E.F. opposite to Von Kluck continued to retreat, an error for which Sir John French was bitterly criticized by Joffre, but which, in fact,

contributed to the German defeat. On 5 September, in the afternoon, a fresh division arrived in Paris to serve with the Sixth Army of Manoury. There was insufficient rail transport for the forty miles from Paris to the battlefield where Manoury was already attacking the Germans. It was then that the Paris police, on Gallieni's orders, seized some 600 taxi-cabs in Paris, bundling the fares unceremoniously out on to the pavement. They collected the taxis at a suburb in the east and transported some 3,000 soldiers to the battlefield in a series of rapid journeys.

Von Kluck, when his rear was attacked by Manoury drew back and in doing so now exposed the advanced part of the German Second Army which, on 8 September, was suddenly attacked by the French Fifth Army and the B.E.F. If Manoury's Sixth Army had been up to strength, it is possible that Von Kluck and the German Second Army would have been encircled. As it was, the threat was enough and on 9 September both the armies on the German right, those of Von Kluck and Von Bülow, began to retreat.

On the rest of the Front from the Rhine to the sector next to Paris, German attacks had been launched and had been repulsed with losses, but the German Army was still numerically superior to the French, confident in victory and had not in fact been defeated. Except for the panic which had seized the German right wing as a result of its own disorder and the unexpected attack of General Manoury, nothing decisive had occurred. But battles are won, as Liddell Hart has written, "in the minds of the opposing commanders, not in the bodies of their men".<sup>1</sup>

The intensity of relief and joy in France after the Battle of the Marne was unbelievable and all the greater in that, until the Germans were almost in sight of Paris, events had moved so fast that the French people had barely realized that France had been near to total defeat. General Joffre's reputation soared to the sky. He certainly deserved much of his fame. Over-phlegmatic and unimaginative as he was, he and his staff had nonetheless preserved the unity of the French Army during a campaign in which it had met with disaster. The French Army had been able to turn on the Marne, still a disciplined fighting force, capable of hitting back. A proof of Joffre's power of organization was the moving of a large number of divisions from the French right in the east to the Paris sector during and after a long retreat. He should perhaps have moved more and moved them faster, but all the same on 9 September the French and British outnumbered the Germans in this vital western end of the battlefront.

<sup>1</sup> *A History of the World War 1914-1918*, by Liddell Hart. Faber and Faber, 1930.

But Joffre was not a great enough man to acknowledge that it was General Gallieni's insight and tempestuous action which had really made possible the victory. When the French Army, still retreating, had crossed the Marne, there was no evidence that Joffre intended to fight. Indeed, he ordered the advance point of the French forces at Verdun, in the east, to be abandoned and he was disobeyed by the French commander in the sector, General Sarraill. At first, Joffre had ordered Gallieni and Manoury to attack south of the Marne, and had this order not been countermanded and permission given to attack to the north of the river, the German panic might never have taken place. For, once more, it was the sudden offensive behind their advance lines which made Von Kluck and Von Bülow lose their heads and it was the psychological shock of Manoury's attack which mattered.

On the German side, the principal factor making for the defeat was the inability of Von Moltke, a shadow of his great father who had commanded in the 1870 war, to control his generals and also his irresolution. The German war plan was to strike with all the force at the disposal of Germany at France and to conduct a holding operation against the Russians. Yet, alarmed by the Russian advance in East Prussia, on 25 August, Von Moltke diverted four divisions from France to the Eastern Front. When, on 6 September, the attack on the German right began, Von Moltke sent a staff officer to contact Bülow and Von Kluck and delegated to this officer, a Colonel Hentsch, who was later killed in action, the right to make all tactical decisions.

Hentsch, when he arrived at Von Kluck's headquarters, found that an order to retreat had already been given, and this he himself, in view of his knowledge of the state of the German Second Army, confirmed and then extended to a general retreat.

There was another psychological factor which added to the nervousness of Von Moltke and his staff. There was a fear of a British landing on the coast, a groundless fear for the British Army was almost wholly absorbed in the British Expeditionary Force. There was a fear too of Russian forces being brought over the Channel from Britain. For one of the rumours which had swept through Britain in early August was that a large Russian army had landed in Scotland and had been taken by trains to the South Coast. A railway porter was said to have found snow on the platform of the station where these trains had stopped. Absurd as it may seem, this rumour was taken seriously by the German General Staff.

Sir John French, with great skill and dash, now moved his troops

north-west and, outstripping the retreating Germans, joined the small Belgian Army still holding out on the Belgian coast. In two bloody battles outside Ypres, against superior German forces, he safeguarded the vital Channel ports of Calais and Boulogne. During the German retreat and the British dash across country, the Allied generals were full of optimism. It was thought that the French troops would be across the Rhine in a fortnight and Sir John French hoped before then to be in Brussels. In fact, the pursuit of the Germans by the French was disappointingly slow, and though Gallieni had shown a flash of Napoleon's genius the French generals showed little of that vigour in pursuit which had always characterized the Napoleonic armies.

In any case, the German Army was not broken, and by the winter of 1914 to 1915 a war of movement had given place to a war of attrition and the soldiers of all three countries began the terrible experience of trench warfare. From the Channel to the Vosges the rival armies were, despite desperate courage, to be unable to do more than dent each other's lines.

The Germans still possessed immense advantages; they had, in 1915, more guns, howitzers and above all machine-guns; their defensive positions were stronger, their troops better trained, and they still held most of Belgium and the industrial regions of France which included nearly all France's iron and steel resources.

From the winter of 1914 until November, 1918, the Western Front was to witness an orgy of slaughter such as no other war in history has ever paralleled. The fortunes of war were to sway this way and that, with one side or the other gaining a few yards of shell-pocked ground. Throughout the whole of 1916 the great Battle of Verdun raged and most of 1917 saw a huge British Army wasting immense numbers of men in an effort to break the German Army's morale. In 1918 the ending of the war with Russia enabled the Germans to bring back many divisions from the East, and to make one more desperate attempt to break the Franco-British armies and to take Paris. But the German Army was worn out and the morale of the German people sapped by the blockade. For a few days in the spring of 1918 victory appeared possible to the excited Kaiser, but the Allies were in better heart and reinforced by American supplies and a few divisions.

Germany had lost her only chance of complete victory in September, 1914. No wonder Gallieni's taxis are a legend and men talked for a long time of the Miracle of the Marne.



## *The October Revolution*

### *Russia Becomes the World's First Communist Country*

UNLIKE THE French Revolution with its dramatic events such as the storming of the Bastille, the King's attempted flight and his execution amid howling mobs, the Battle of Valmy, and so on, the Russian Revolution was a terrible grey phenomenon which began in a confused way in February, 1917. The seizure of supreme power by the Bolsheviks in October took place in the middle of the First World War in which Russia was the ally of Britain and France against Germany and Austria-Hungary.

One of the first major acts of the Bolsheviks was to make peace with Germany, thereby releasing hundreds of German divisions for the Western Front; not surprisingly the Allies intervened in Russia against the Bolsheviks. A number of military revolts followed the Revolution and though the Bolsheviks remained masters of Moscow and Petrograd (now Leningrad) it was hard to know, until around 1920, whether or not the Bolshevik Revolution would last.

Russia in 1914 was a total autocracy, ruled by a weak but obstinate Czar, Nicholas II. In 1905 after the defeat of Russia in the war with Japan there had been revolutionary outbreaks all over the country and the Czar had had to make concessions. A Parliament, the Duma, was created and measures were taken to see that serfdom, formally abolished in 1861, was ended. But the Czar gradually withdrew the powers granted to the Duma and, influenced by a strong-willed, narrow-minded, bigoted Empress, set his face against any form of representative government.

The middle classes and liberal intellectuals had never had any political experience and, when the Revolution came, power lay with the proletariat of Petrograd and Moscow and with a small group of revolutionary Socialists. The Bolsheviks, who had been only one of the many groups fighting the Czarist régime underground, were the nearest to the workers, the best organized and they were led, when the trial of strength came, by a man of the greatest genius, Vladimir Ilyich Ulyanov, known as Lenin.

With the aid of French loans, Czar Nicholas embarked on the

First World War under the illusion of being prepared for it. At the beginning of 1914, huge Russian armies poured into Austria-Hungary—the Russian steam-roller—and menaced East Prussia. A series of terrible defeats was inflicted on these armies in 1914 and 1915 and, although in 1916 once again a Russian offensive under General Brusilov was mounted, it was apparent that Russia for all its huge population and space could not stand up to the Germans. Only a thorough reorganization of this administration, the building up of a huge munitions industry and fundamental democratic reforms, might have given the Czarist régime power to avoid disastrous defeats and survive the war.

The Russian armies were beaten so decisively much more because of the government's failure to give them the means of fighting than by superior German generalship. Hard as the Russian peasant soldier could live, he could not face the long periods of starvation caused by the constant breakdowns in supplies. In some of the great battles of 1915, divisions had gone into battle with every third man without a rifle. By 1917 the Russians had lost four million men.

At home, backward Russian agriculture failed to feed the towns and all through 1915 and 1916 bread riots and popular manifestations shook the faith of foreign observers in the Czarist régime. In December, 1916, the favourite of the Czar and the pro-German Czarina, the monk Rasputin, was murdered. But it was too late for Nicholas II to seek better advisers and anyway he was too stupid. The murder showed that autocracy was feeble.

A Russian intellectual, Sukharov, wrote, in February, 1917, in his diary<sup>1</sup>:

"Tuesday, February 21st. I was sitting in my office. Behind the partition two typists were gossiping about food difficulties, rows in the shopping queues, unrest among the women, an attempt to smash into some warehouse.

" 'Do you know,' suddenly declared one of these young ladies, 'if you asked me it's the beginning of the Revolution.'

"These girls did not understand what a Revolution was. Nor did I believe them for a second. But in those days sitting over my work, over my articles and pamphlets, my manuscripts and proofs, I kept thinking and brooding about the inevitable Revolution that was swirling down on us at full speed."

What happened during the February Revolution was first a general strike on 25 February,<sup>2</sup> then a tram strike, then more bread

<sup>1</sup> *The Russian Revolution*, Sukharov. O.U.P., 1955, London.

<sup>2</sup> Throughout this article the old-style Russian calendar, thirteen days behind the Western reckoning, is used.

riots, then the defection of a regiment sent to repress some demonstrators. On 27 February all factories in Moscow and Petrograd were again on strike and Cossack troops, relied on for their obedience and ferocity, refused to take action against the strikers. The Czar dismissed the Duma, which, however, refused to disperse. Police had disappeared from the streets. Still the government continued to issue menacing orders to the population and the Czar ordered divisions to be sent from the front to Petrograd, which was then the capital of Russia.

In Petrograd a Soviet consisting of workers' and soldiers' representatives, together with some members of the Socialist and Menshevik Parties, called on soldiers to obey its orders and to refuse obedience to officers who were loyal to the Czar. Czarist ministers were arrested and then the hitherto passive Duma created a Provisional Government headed by Prince Lvov. The new government persuaded the Czar to abdicate and this was announced to the world on 2 March by the Foreign Minister Miliukov, together with Russia's determination to go on fighting in the cause of democracy against the Central Powers. In France and Britain this first phase of the Revolution was warmly welcomed.

From February until October "bourgeois" governments tried to keep Russia in the war, to the strains of the "Marseillaise"; the Petrograd Soviet, a huge confused assembly, was at first also in favour of fighting the Germans but more concerned with getting bread and ensuring the end of privileges. The government lacked power, the Soviets at first lacked leadership; each was frightened of the other.

The Bolshevik and Menshevik intellectuals in the Petrograd Soviet themselves believed that a Socialist Revolution should first be preceded by a period of middle-class rule in which a modern state administration would be at least put into place, so that, when a Socialist Revolution came, it had instruments with which to master the country. All over Russia, in the country towns and villages as well as the large cities, the Czar's abdication was followed by a period of confusion with new right-wing parties, such as the Cadets and groups of officers, hoping to be able to crush the urban Soviets. Kamenev and Stalin, experienced Bolshevik leaders, advised the Petrograd and Moscow Soviets not to take precipitate action against the Provisional Government.

In April, 1917, Lenin arrived back from Switzerland, having travelled by train through Germany, and immediately took over the leadership of the Bolsheviks. In one of his first speeches, in the

luxurious house of a great ballerina and former mistress of the Czar, Lenin demanded the overthrow of capitalism as the only way to end the war. Many Socialists thought he was a German agent.

Lenin's journey, it is now clear, was arranged by Swiss Socialists and he had made no promises to the Germans in return for being allowed to travel through Germany. He had merely, through the Swiss, stated that he would try to secure the release of some German civil prisoners. The German authorities had a closer view than the British of what was happening in Russia and thought that it was in their interest to increase the strength of the Soviets against the Provisional Government. It is doubtful if they appreciated the full importance of Lenin. Nevertheless, Lenin's arrival via Germany excited the imagination of those who believed, as did Winston Churchill, that the Revolution was tragedy for Russia. He wrote many years later that:

"Upon the Western front the Germans had used the most terrible means of offence. They had employed poison gas on the largest scale and invented the *Flammenwerfer*. Nevertheless, it was with awe that they turned on Russia the most grisly of all weapons. They transported Lenin in a sealed truck like a plague bacillus."

Lenin urged that the Soviet should take power at all costs, and alone if necessary. From April to October there was growing clarity of purpose among the Bolsheviks' fragment. Lenin began to attack the Mensheviks and moderate representatives in the Soviet together with those who had taken office with the Provisional Government; he also attacked the war which the government was still carrying on. Indeed, an offensive had been mounted on the South-western Front with, of course, pitiable results.

In July, after the suppression of popular demonstrations against the war, there took place in Petrograd and Moscow a shift to the Right. Alexander Kerensky, a Socialist with a gift of eloquence and confidence in himself, became head of the government and called a conference in Moscow which was attended by the Commander-in-Chief of the Russian armies, General Kornilov. Lenin was forced to fly to Finland; Trotsky, the military expert of the Bolsheviks, was imprisoned; the death penalty for military disobedience was reintroduced. But the facts of life were against the government, although in a dim, uncertain way the vast areas of Russia were more behind Kerensky than the Petrograd and Moscow Soviets.

In September the Germans took Riga. Kornilov, who had already quarrelled with Kerensky, ordered two divisions of picked troops to

advance on Petrograd and make an end not only of the Mensheviks but of the Provisional Government. Kerensky was powerless. The Petrograd Soviet was against him. The Bolsheviks persuaded Kornilov's troops not to march, saw that the railwaymen tore up the lines connecting the Front with Petrograd, and nipped the counter-revolution in the bud. Kerensky, now Commander-in-Chief of the armies as well, created a five-man Directorate. But his hour had long passed. Lenin was able to create an armed insurrection which was led by Trotsky.

On the night of 24 October, Red Guards seized the railway stations, power stations, banks and government offices, and on the 25th the Winter Palace, the seat of the Provisional Government as of the Czarist régime. Kerensky fled in an American Embassy car to organize troops at the Front for the defence of the Provisional Government. The events leading to the abdication of the Czar had cost some 14,000 lives in Petrograd. The Proletarian Revolution of October was effected in a few hours and without bloodshed.

At the Congress of the Soviets, called on the evening of 25 October, the slogan was Peace, Land and Bread. Private enterprise of all kinds was abolished, including trade, and the property of the Church and of all capitalists was confiscated. Land was given to those who worked it. None of the representatives of the bourgeoisie figured in the Council of People's Commissars which was set up. Power had passed from an autocracy supported by the Church to a small body of men who were the direct representatives of the proletariat. Lenin, speaking on that historic evening, was described by John Reed in his book *Ten Days That Shook the World*:

"A short stocky figure with a big head set down on his shoulders bald and bulging. Little eyes, a snubbish nose, wide generous mouth and heavy chin . . . dressed in shabby clothes, his trousers much too long for him. Unimpressive to be the idol of a mob, loved and revered as perhaps few leaders in history had been."

The Bolshevik régime was at once threatened by wars. General Kornilov, after his failure to march on Petrograd, raised a force of Don Cossacks to fight the Bolsheviks. The Cossacks, joined by thousands of anti-Bolsheviks, penetrated deep into Russia under General Denikin, Kornilov having been killed in action. Denikin's forces occupied the Ukraine, which the Germans had left in the power of anti-Bolshevik movements. In Northern Russia, General Yudenitch advanced on Petrograd in October, 1919, and, until the failure of his offensive, was helped by an Anglo-French force based

on Murmansk. In Siberia, Admiral Kolchak with Japanese troops and a Czech Legion set up a White Government. All these revolts collapsed, partly on account of the Red Army commanded by Trotsky, but also because nowhere did they receive adequate support from the peasants, and there was no representative civil government behind them.

Strangely enough the last period of civil war was marked by uprisings against the Bolsheviks by the peasants, and by other forms of unrest. In May, 1917, it had been the town of Kronstadt, the naval base on the Baltic Sea, which had first declared that it only recognized the Soviets of Petrograd. Yet early in 1921 it was a mutiny of sailors against the Bolshevik Government which made Lenin decide that the Revolution in its present extreme Socialist form must be tempered by a retreat towards Capitalism.

Under N.E.P. (the New Economic Policy) ownership of land was restored to the peasants and the rights of small capitalist entrepreneurs and traders were once again recognized. The N.E.P. undoubtedly saved Russia from economic collapse. Lenin was at once an idealist and a supreme opportunist. He had believed it right to make a revolutionary seizure of power by the proletariat. He had done this because he thought that in spite of the backwardness of Russia, which made a successful Socialist revolution so hazardous, the workers of the world would also revolt against their governments and therefore a Russian People's Republic would not be alone. This did not happen, and although the British Labour Movement was strong enough to prevent Allied intervention in Russia after 1920, the Union of Soviet Socialist Republics was long to remain a pariah among the nations of the world.

Lenin was a revolutionary who was capable of the most extreme and ruthless action; but he wanted a Russia, and a world, in which the State with its army, its police, its laws to protect property, would wither away and be replaced by a rational human society in which all men lived in harmony. He thought that once the Bolshevik Revolution had been successful this would be effected, thanks to the sympathy of the outside world. Without great oppression or bloodshed, the bourgeois, he thought, with their attachment to old ideas, could be liquidated gradually and peacefully.

The hostility of the outside world and the civil wars in Russia created a climate of oppression and hatred which brought Lenin's dream to nothing. Bolshevism could only triumph with blood-stained hands. Already, by the end of the civil wars in 1922, the workers and peasants had been deprived of their liberty and the

foundations laid for a new autocracy, that of a one-party State. Stalin, who tried to collectivize agriculture with the maximum speed and to make Russia an industrial power, ended by creating a tyranny as ruthless and far more efficient than that of the Czar. Though the Russian Revolution ended by being the opposite of what its great founder Lenin had intended it to be, nevertheless the long developments which had made Western European industrial society were, in Russia, compressed into a few decades. Lenin had understood this in his celebrated phrase: "Communism is the power of the Soviets plus electrification." The 1917 Revolution became the taking-off point for Russia's advance to becoming one of the two great world powers.

In the Western world, the Socialist and progressive parties gradually began to see that the methods and aims of Communism were not theirs. But during the twenties and thirties, Communism, among all the nations of the West, exercised a disintegrating influence and accounted for some of the support of Italians and Germans for Mussolini and Hitler. The cause of the Spanish Republic became to a large extent that of Communism, and Franco owed, at many different periods, his successes to that fact. As a revolutionary force in the West, Communism had a renewed access of strength after the Second World War; but it has to-day died away as a revolutionary creed although large Communist parties still remain in France and Italy. In the Far East it is another matter and Red China, the world's most populous country, has adopted Communism; while Russia is increasingly prepared for co-existence with the free world, China is urging world revolution on the proletariat of Asia and Africa.

As in Russia a primary rôle of Communism in China is the transformation of a backward people into a modern one; whether, slowly, the Chinese will return to the comity of nations, as the Russians seem to be doing, is still an open question. To find a means of creating understanding between Eastern Communists and the free world is one of the most important tasks of our time, and failure could bring civilization to ruin. So the Bolshevik Revolution of 1917, although what it stands for has undergone so much fundamental change, is still a live factor to-day. It was certainly the most momentous single happening during the First World War and is an unmistakable landmark in world history.

## *The Treaty of Versailles*

### *The Seed is Sown of the Second World War*

AT 11.00 a.m. on 11 November, 1918, fighting ceased on the Western Front for the first time since 1914. Turkey, Bulgaria and Austria-Hungary had collapsed and Germany remained alone in the field.

Yet the German collapse was unexpected. In the early spring of 1918 the German armies, reinforced by many divisions from the Eastern Front (Russia had been virtually out of the war after the October Revolution of 1917), nearly broke the Franco-British front in two and came within forty miles of Paris. But when the French and British armies with new American divisions counter-attacked, the German armies had no fight left in them. By August, 1918, Hindenburg and Ludendorff knew the game was up and told the Kaiser to seek peace.

On 9 November, the Kaiser abdicated and fled to Holland; a German Republic, headed by a socialist, Ebert, was set up by the military—who needed the Socialists to crush Communist revolts—and the Germans accepted the Armistice. They were to surrender all guns, aeroplanes and the German battle fleet and to retire across their frontiers. The war had resulted in the death of 8 million men in battle, a larger number still were seriously disabled and, throughout the world, partly as result of epidemics caused by the war, 25 million people had perished. In November, 1918, and for a long time after a large part of Eastern Europe was in chaos with indescribable suffering for most of the inhabitants of the broken Austrian Empire and Russia. In Serbia half the whole male population had been killed by the war.

At the time of the Armistice Marshal Foch wanted to enter Germany at once: but the politicians said no. Here was the beginning of the conflict between those who wanted a hard peace and those who wanted a reasonably lenient one, a conflict which lasted throughout the Paris Conference. The result was a peace which was neither hard nor reasonable. When the German armies came back to their homeland they were told by President Ebert that they



had never been defeated. So, again at the beginning, there arose a myth that Germany had been betrayed by its civilians and that its army was invincible. This was to do incalculable damage.

The Paris Peace Conference started and ended in confusion. It resulted in a series of Treaties made with the vanquished powers; that with Germany, the Treaty of Versailles, was the most important and a landmark in men's minds throughout the twenties and thirties. It may be said that the new States which were created at the Paris Conference—Poland, Czechoslovakia and Yugoslavia—were positive results, and results which showed that the new spirit of national self-determination had triumphed over the old concept of Imperial rights.

Certainly, at the Paris Conference, the map of Europe was redrawn in a way which corresponded to the spirit of the time. But the fact is that the Poles re-created their ancient State, which had been partitioned by Prussia, Austria and Russia in the seventeenth century, by their own efforts; so did the Czechs and the Slovaks; and as Austria-Hungary crumbled in 1918, the southern Slav subjects of the old Hapsburg Empire united with Serbia.

The peace-makers merely endorsed these things. Nor could they stop the Poles from unwisely extending Poland's new frontiers into eastern Galicia and from seizing Vilna from the new Baltic country of Lithuania. The peace-makers were powerless to prevent the Rumanians, who had entered Hungary to put down a Communist revolt, from seizing Transylvania which was Hungarian in population. In 1918 the Allied armies were nearly as exhausted as the defeated armies of the Central Powers. Their soldiers were clamouring for demobilization. Strikes took place in France and Britain to prevent intervention in Russia.

To look at what all the Peace Treaties decided would be impossible in the space available. Let us note just a few things before examining the German Treaty. Japan seized the German concession in China of Shantung and began her career of conquest in the Far East. No one could stop her. The new Turkey under Mustapha Kemal rejected the Treaty of Sèvres, which had given Greece and Italy parts of Asia Minor in compensation for their war effort. A Greek-Turkish war ended in a complete Turkish victory, the massacres of Greeks at Tymir and a new Treaty in Lausanne in 1922; it led also to increasing estrangement between France and Britain, who quarrelled also over the settlement of Turkey's former possessions in the Middle East, and to the fall of Lloyd George who had given the Greeks the backing of Britain. Austria was left as a small,

German-speaking, backward agricultural country but with a capital, Vienna, of 6 million people. It was unavoidable perhaps that this economic absurdity should have been created. Austria was not allowed to unite with Germany.

Thanks to the principle of respecting national communities, Germany only lost some 13 per cent of her former territory; the losses consisted of a small slice on the Belgian frontier, the northern part of Schleswig-Holstein which went after a plebiscite to Denmark, and most of Silesia, together with Danzig which became a free city and had a long corridor connecting it with Poland. The Saar with its coal-fields was handed over to the League of Nations, the coal-fields being given to France for fifteen years. The Allies were to occupy the west bank of the Rhine for various periods to ensure that Germany did not default on reparations and the Germans were forbidden to have troops or fortifications on the left bank of the Rhine.

Germany had to disarm and was not allowed an army larger than 100,000 men. The disarmament clauses, the German leaders knew, could be circumvented: and they were. What most rankled with the Germans was the loss of Silesia, the Polish Corridor and reparations. The Poles they considered an inferior race. Over reparations the Allies could not agree, at the time the Peace Treaty was signed, on what sum to demand; but the principle was that the Germans being responsible for the war must pay for all war damages—including pensions for the Allied injured.

Looking at the Peace Treaty to-day, one realizes that reparations on the scale demanded were a folly. By the end of the twenties, the whole idea of making Germany pay was more or less abandoned, and the solution was arrived at by which the Americans lent money to the Germans who paid fixed sums to the Allies who, in their turn, repaid the money which they had borrowed from the United States. But reparations helped to poison the atmosphere during the post-war years and resulted in the French and Belgian occupation of the Ruhr when the Germans defaulted, against the advice of the British who refused to take part. So reparations even helped to destroy Allied co-operation which, from the end of the Peace Conference, was shaky.

The harsh clauses of the German Peace Treaty made it impossible for Germany to accept the Versailles settlement. Yet the Treaty left Germany potentially the most powerful nation in Europe, with the greatest industrial resources on the Continent, and with a population of 60 million compared with France's declining population

of some 43 million. Further, this powerful nation was no longer faced, on her eastern frontier, by Russia but by two inevitably weak States, Poland and Czechoslovakia, against whom Germany had grievances and each of which contained German minorities.

The errors of Versailles could be laid at the doors of the victorious nations but particularly of Britain, France and the United States. Lloyd George, Clemenceau and President Wilson dominated the conference. But the errors of the Peace Treaties were due also to a deep division in world opinion about the nature of the peace, a division which affected the actions of the politicians.

When the ordinary intelligent man, whether he lived in Manchester or Lyons or Milan or Chicago or Tokyo, reflected on the war and its horrors, he wanted a peace which would not only rule out war but which would give world politics a better moral basis. This desire for something "noble and kind and good", in Kipling's phrase, accounted for the world-wide popularity of President Wilson, whose Fourteen Points seemed the way to real peace and whose advocacy of a League of Nations seemed right.

But, unfortunately, when these same people had to pronounce on the claims of their particular countries, the sort of peace they were inclined to demand was the opposite of the ideal—it was a peace of revenge, or at any rate a selfish peace. This latter attitude applied, in a sense, less to the French than to the British, the Italians, the Japanese or the new nations who were filled with bitterness not only against the Germans but sometimes against each other. The French were comparatively disinterested in what happened outside Europe; they were not trying to grab new territory, what they wanted was security. Clemenceau, the aged politician who had become a virtual dictator from 1917, and whose energy had pulled France together, had no belief in human idealism or in the regeneration of the Germans. He and his fellow-citizens wanted French troops on the Rhine, a hard just peace. He was the permanent chairman of the Peace Conference. Known as "The Tiger", his manner was frequently savage but always impressive. The British economist Maynard Keynes described him at the conference:

"a very good thick black broadcloth and on his hands, which were never uncovered, grey suede gloves; his boots were thick black leather, very good but of a country style. His walk, his hands and his voice were not lacking in vigour but he bore, nevertheless, the aspect of a very old man conserving his strength for important occasions. He spoke seldom, leaving the initial statement of the French case to his officials. He closed his eyes and sat back in his chair with an impassive

face of parchment, his grey-gloved hands clasped in front of him. A short sentence, decisive and cynical, was generally sufficient. An abandonment of his ministers, whose face would not be saved, or a display of obstinacy reinforced by a few words in a piquantly delivered English. But speech and passion were not lacking when they were wanted and the sudden outburst of words, often followed by a fit of coughing, produced their impression by force or surprise, rather than by persuasion."

One principle to which Clemenceau clung with all his might was that France must not separate her policy from the Anglo-Saxon powers. He thought little of Wilson; he esteemed Lloyd George whom he considered clever at, in his phrase, "reversing the beatitudes", which meant applying moral standards to other countries which Lloyd George himself violated. Owing to Clemenceau's belief in the Alliance, he reluctantly agreed to renounce the Rhineland and accept instead an Anglo-American guarantee to come to France's aid if she were attacked. Without Clemenceau, no Treaty would have been signed. He lost his position in France, failed to be elected President of the Republic in 1920, and retired for good. The French felt that Clemenceau might have won the war but that he had lost them the peace.

Lloyd George was the cleverest and the most adaptable of the Big Three. On the night of the Armistice, he and Churchill dined together and agreed that Germany must be punished, but must also be put on her feet or there would be permanent chaos in Europe. But at the General Election the British people clearly wanted something different. They wanted to hang the Kaiser and to "squeeze Germany until the pips squeaked".

For all his prestige, Lloyd George had to trim his sails. At the Peace Conference the British were as insistent as the French on heavy reparations and it was Lloyd George who insisted on the demilitarization of Germany. He was much impressed by the need to ensure unity among the European Allies. He very often referred to a letter he received towards the end of the Conference from Sonnino, the Italian Prime Minister, who warned him that the peace was shaky and that it was unwise to have 40 million Italians, as well as all the other countries who felt themselves grieved, against him.

But over the Rhineland, Lloyd George backed Wilson; he did not want to see France with German territory in her hands since this could lead to a war of revenge. He wanted to see Germany able to recover economically. At the last phase of the Conference he

tried to obtain certain fundamental alterations with regard to loss of German territory to Poland. Curiously enough, President Wilson who, having lost his enthusiasm for investigating injustices in order not to damage acceptance of his great remedy, the League of Nations, argued against him.

President Wilson, in the eyes of millions of people throughout the world, was expected to be the master-mind of the Conference. America, in Wilson's words, had been "too proud to fight" at the beginning, and had only entered the war in 1917, and then only because American ships were being sunk on sight by German submarines. To the hard-pressed Allies, the United States brought an endless supply of soldiers, guns and ships—and a promise of inevitable victory. The Germans noted that the United States had come into the war as an "associate", not an Allied power, and that the American President in his Fourteen Points Peace Plan had promised a peace without annexation or revenge. To them and to the Allied peoples as well, President Wilson embodied a new world of peace and justice.

Unfortunately for the world the American President liked his rôle of Messiah, and, as Churchill said, was too often "lost in the upper regions of spiritual idealism" With his long narrow face and pince-nez, dressed in his formal black clothes, this former professor of constitutional law turned politician, was not a great enough man to stand the flattery which was lavished on him. To the crowds who greeted him in Paris, Rome and London he embodied the idea of a popular preacher who, because of the great power of the United States, might indeed save the world. To clever European statesmen he seemed inexperienced and woolly-minded and they sometimes shuddered at his confident smile, which bared his huge teeth.

His decision to lead the American delegation himself (he was the only Head of State to do this) was much criticized by some of his advisers. A far greater blunder was that the President did not associate the Republican Party with his peace plans. President Wilson had been elected Democratic President in 1912 with a record majority owing to a split among the Republicans. Somehow or other he overlooked the fact that the Republicans were gaining in the United States and that indeed when he came over to Europe there was a Republican majority in the Senate. But Wilson remained confident that the peoples of the world, including the Americans, would see that he could put his ideas for world peace into operation.

Before he landed in Brest in January, 1919, the month the Paris

Conference opened, he told his entourage, with its accompanying journalists, that most of the Allied leaders were imperialists who did not have the trust of their peoples. President Wilson's great idea was the creation of a League of Nations which should make war for ever impossible. As he found that it was increasingly difficult to make peace in accordance with his lofty ideals, he concentrated more and more on the League to which Germany would, after a period of penance, be admitted and, once in, would forget ideas of revenge. Most unwisely, the President rejected a French proposal to give the League of Nations an armed force with which to maintain peace. No, Wilson thought, the League must have its strength in human idealism. Thereafter Clemenceau accepted anything about the League which Wilson wanted, considering it on the whole a thing of no consequence.

Unfortunately for the world, the Americans, like so many other peoples, also made an unidealistic final choice and refused to ratify the Peace Treaty or to enter the League of Nations. They returned to isolation. The effect on French opinion was disastrous. Since the Americans had rejected the Treaty, the Anglo-American guarantee to come to France's aid also lapsed.

When the German government learnt the peace terms, it dared not sign. Hindenburg was consulted, and returned an evasive answer. Fifteen minutes before the Armistice expired on 24 June the German government decided that it would have to sign in order to avoid a march of the Allied armies to Berlin. The German delegation, who had been kept more or less as prisoners in Versailles, came into the Great Hall of Mirrors, where in 1871 the King of Prussia had been crowned Emperor of Germany, and, in total silence, signed the 440 articles of the Treaty. This was on 28 June, five years to the day since the assassination of the Archduke Franz Ferdinand of Austria at Sarajevo.

To have made the Versailles Treaty workable it was not sufficient for Germany to join the League of Nations; it was necessary that the German people and its élite should have wanted to make peace in Europe by accepting the Treaty sincerely and striving peacefully to modify its injustices. This never happened. The Germans never accepted Versailles. There came a ray of hope in 1924 when Britain, France and Italy freely negotiated the Treaty of Locarno with Germany which was to make war impossible in Western Europe. The liberal French Foreign Minister, Briand, said that on that day the statesmen of the West had talked European, a language which all the world would have to learn. But the German Foreign Minister

## THE TREATY OF VERSAILLES

Stresemann refused to consider making similar pacts with his eastern neighbours.

- Peace and prosperity might have created democracy in Germany. But this was not to be. After some improvement in Germany's economic position in the late twenties, there came the Great Depression which started in Wall Street in 1929. Germany suffered from it more severely than most European countries and in 1933 had 6 million unemployed. In that year Hitler came to power at the head of a mass nationalist movement. The world moved inexorably towards a second world war. This, of course, constitutes the final verdict on the Paris Settlements and the Treaty of Versailles.

## *Einstein's Theory of Relativity*

### *A Revolution in Physics*

IT WAS November, 1919. The War to End War had been over for nearly a year; England seemed to have little better to do than settle down and observe the first anniversary of the Armistice. Little else was happening—or so it seemed. The momentous anniversary was occupying most men's minds, to the exclusion of all else.

Then, on the 7th of the month, the London *Times* came out with an unexpected headline. "Revolution in Science" it shouted, in big, black letters, "Newtonian Ideas Overthrown". Breathlessly it went on to describe the previous evening's meeting of the Royal Society, in which the results had been announced of an expedition to the Gulf of Guinea.

Surely, men thought, as they read on, surely no expedition to the Gulf of Guinea, even to the summit of Mount Everest, could be called "a revolution in science"? *The Times* was talking through its hat.

But by the end of the article, the man in the street, though he might be little wiser, was satisfied that something exciting had been happening in the Gulf of Guinea. (But where *was* the Gulf of Guinea?) No one could ignore so great a person as the President of the Royal Society, and he himself had said: "This is not the discovery of an outlying island, but of a whole continent of new scientific ideas—it is the greatest discovery in connexion with gravitation since Newton enumerated his principles."

What the expedition had done was to verify the whole of Albert Einstein's Theory of Relativity, the astonishing theory of high-speed motion, the new, half-understood, Physics which seemed to unify all the branches of the subject. A few observations of the stars, viewed from Guinea, had thrown over almost the whole of the old Newtonian theories; proved them, while adequate to deal with occurrences on the earth, quite inadequate to deal with objects moving at tremendous speeds—speeds approaching the 186,000 miles a second of light.

One of Einstein's more bizarre calculations—which the Expedition



now proved correct—was that a clock, or a time-keeping mechanism of whatever construction, which happened to be travelling at a speed of 161,000 miles a second, would be registering time at exactly twice the rate of a clock which was—relative to it—stationary. It would register that speed simply because time itself had speeded up. And not only time altered at these speeds; so did dimension and mass. At this same speed a man travelling head-first through space would be exactly half his usual length. (But as any yardstick he might carry to verify this alarming fact would have shrunk by the same amount, he would be unaware of the change.)

Einstein had proved this to himself—and many things like it—entirely through a process of reasoning and mathematics. None of these phenomena had been observed or even suspected, apart from a peculiarity in the orbit of the planet Mercury, which his theories explained. There seemed little chance of checking on the behaviour of objects at the speed of light, but it was agreed—reluctantly at first—that if light could be observed to bend as it passed near the sun, a phenomenon predicted from the same calculation and which most scientists considered ridiculous, then the whole theory could be taken as accurate.

The 1919 eclipse, long predicted, provided just the right opportunity. It would be total—that is to say, the whole of the sun would be obscured by the moon—in a latitude near the equator, and two expeditions accordingly set sail for that latitude. One went to northern Brazil, the other to the Gulf of Guinea, off West Africa, each as insurance against weather conditions which might affect the other. It was calculated that with the sun's light temporarily blotted out by the moon, pictures could be taken of the bright group of stars through which it was passing. The apparent position of these stars could then be compared with pictures of the same stars taken at another time and by night, in London, when they were far from the sun and therefore much less exposed to its gravity.

Though Einstein himself seems to have been unmoved—he had no doubts about his theory—there was consternation, then rejoicing, among others when the pictures from the eclipse proved it. Yes—the star-images on the photographic plate had been deflected by exactly the amount Einstein had calculated—in other words, their light, passing the sun, had been deflected by its gravity. There could no longer be any doubt about the Theory of Relativity.

And yet, as the President of the Royal Society went on to say, "I have to confess that no one has yet succeeded in stating in clear language what the Theory of Relativity really is."

No one could. A few scientists understood the consequences of this new, all-embracing theory within their own special fields; none could as yet grasp the meaning of the theory itself.

Yet, a few years later, the theory was the standard, essential, tool of every physicist, and the words "Einstein" and "Relativity" were being bandied about by half the world. At least one reason lay in the remarkable character of Albert Einstein himself, a kindly, intelligent, yet strangely naïve man, with great charm. It was this character which gave Relativity a publicity no other theory in Physics ever enjoyed.

He was born on 4 March, 1879, in the German town of Württemberg, but left with his parents when he was only a year old, to move to Munich in the south. Here his father started a small electro-chemical factory with his brother, Albert's uncle. It was from this uncle, rather than from his father, that the boy got his interest in science and mathematics. From his mother, who was a musician, he inherited a deep love of music.

The family was Jewish and the boy was brought up in that faith, but as there was no convenient Jewish school he was sent to a Catholic one and absorbed that faith as well. Quite probably this peculiarity in his upbringing accounted for his life-long hatred of prejudice and bigotry, his reluctance to become identified with any nation or group. He became fascinated by mathematics, largely through his uncle who set algebraic problems to him in the evening, much as other uncles might read stories. "The animal we are hunting is hidden. We will call him 'x' for the moment—but we'll get him, all right——"

When he was fifteen his father lost money and moved south again, to Milan, but Albert, who was at the best school in Munich, was left behind to get his diploma. To the annoyance of his parents he decided to follow them without waiting for it. As by now his father had lost more money and was quite unable to keep him, he was despatched north again, to the Polytechnic Institute of Zürich, in the hopes that this might fit him for some scientific career. After these studies—during which he married a fellow student from Hungary—he had difficulty in getting the job he wanted and eventually could only get one with the Patent Office in Berne. Loving his new country, he renounced German citizenship. He and his wife had two sons, and although the marriage between this happy-go-lucky Bohemian who forgot to wear matching socks or comb his hair, and his reserved, suspicious East European wife, had begun to falter, these sons kept it alive.

It was while he was at Berne, with time on his hands at the Patent Office, that Einstein published his first two papers, on the Transformation of Light and the Electrodynamics of Moving Bodies. These caused a small stir in the academic world. How could a petty official in, of all places, the Patent Office, make such researches, have the intelligence to set them out in this fashion? Perhaps, if they were genuine, he should be given some University appointment?

He was appointed to the University of Zürich—and here, where one had to keep up appearances, wear matching socks and a well-pressed suit, he was miserable, and very poor. As he was to remark years later, recalling these Zürich days, "In my relativity I set up a clock at every point in space—but in reality, I found it difficult to provide even one in my room."

From Zürich, working hard on his theories, to Prague, thence back to Switzerland and to the old Polytechnic, as a teacher. By now he was a world figure. His Special Theory of Relativity, the precursor of the General Theory, had been published in 1905. He was appointed Director of the new Kaiser Wilhelm Institute in Berlin, and although as a Jew he was beginning to distrust Germany he accepted the post with its much higher salary, its opportunities for research.

His wife, Mileva, refused to go. She knew she would hate Berlin—and in any case they were agreed the marriage had failed. She and the boys stayed behind, and shortly afterwards divorce came through. Fortunately for Einstein, there was a distant cousin living in Berlin, and she took good care of him. A friendly, happy person, she was amused by her cousin. A year later he married her.

He was in Berlin for twenty years, from 1913 to 1933, and it was during these years that he developed his Theory of Relativity from the Special Theory of 1905 to the all-embracing General Theory. The assumption of the former was that the velocity of light and indeed all the laws of nature are the same in all co-ordinate systems moving uniformly, relative to each other. In General Relativity, this was extended to co-ordinate systems in non-uniform (i.e., accelerated) relative motion. General Relativity also shows that if matter is converted into energy, the energy released is shown by the simple-seeming formula,  $E$  equals  $mc^2$ , where  $c$  is the velocity of light and  $m$  the mass. The formula shows that a small mass can be converted into a huge amount of energy. It shows, mathematically, the possibility of making an atomic bomb—and nothing could have been less to Einstein's liking than this. It

also gives the secret of the sun. If it were really burning, as people thought, it should have been consumed years ago; in the atomic reaction Einstein substituted, huge quantities of light and heat could go on being created, with the loss of only a very small mass.

His theory began to be accepted during the war, and in 1919 when the Guinea expedition proved it to the satisfaction of all, he became a world figure. He was beginning to hate nationalism as well as racialism and now he wrote: "By an application of the Theory of Relativity to the taste of the reader, to-day in Germany I am called a German man of science; in England I am represented as a Swiss Jew. If I come to be regarded as a *bête noir*, the description will be reversed and I shall become a Swiss Jew for the Germans, a German for the English——"

By 1933 he reluctantly left Germany with its Nazi Jew-baiting, and settled in Princeton, New Jersey. His second wife, Elsa, to his eternal sorrow, failed to make a transition to the new way of life and literally pined away, dying three years later. He stayed on in Princeton, at the New Institute of Advanced Study, until 1955, when he too died. He was mourned universally as the world's, the century's, greatest man of science—and also, though this has little bearing on his huge Theory, as the most approachable. To a colleague in Princeton who was late for an appointment in the town, he remarked, "Don't worry, don't worry—why should I mind that you are late meeting me? Am I less capable of reflecting on my problems here than at home? Here"—showing a much-chewed pencil—"here" is my laboratory."

Relativity, which has transformed physics, has required great changes in our traditional handling of the concepts of space and time. Two events happening in different places may be judged to be simultaneous by one observer and not by another. Simultaneity, Einstein pointed out, is relative to the observer, and four quantities are now involved with it: the three usual spatial dimensions and the fourth dimension of Time.

He was working, before he died, on a new theory, one which would link gravitation with electro-magnetism. The theory as he left it has not been universally accepted, but there is little doubt among physicists that a new theory, embodying Einstein's Relativity, is needed to embrace a connexion between these two phenomena. Without the Theory of Relativity this sort of speculation would be quite impossible; the true workings of the universe in which we live might never have been comprehended.

## *Baird Transmits a Picture of an Office-Boy's Face*

### *The Arrival of Television*

THE EVENING before, he had run through a whole chain of experiments and tests, with neon lights, scanning discs, clusters of glowing, blinking valves, photo-electric cells. The equipment which he had made for himself from Government surplus radio equipment, cardboard boxes, bicycle lamps, had been altered and replaced a dozen times. The only survivor was Bill. Bill had attended each one of John Baird's experiments, since 1924, since the fateful day in Hastings when Baird had succeeded in transmitting—for two yards—the image of a Maltese Cross. Bill had been there as a mute, sympathetic witness, black eyes gleaming in the flickering light of the transmitter, mouth in a permanent, foolish grin.

Now it was the second of October; the year was 1925. Outside in London there was fog; the damp seeped in through the shutters.

John Baird switched on the apparatus in one room, there was a mounting whine as the motor gained speed, overshot, came back to normal; the filaments in the little "bottles" lit up with a dull-red glow. He sat Bill upright in his chair.

A few strides and he was in the next room; the second motor was humming into synchronization with the first. He tuned in this "receiver", got a pink rectangle in his viewing box, focused it. Nervously, he ran back to the other room, adjusted the light over Bill's head. The dummy's eyes lit up. For a moment they seemed to flash with a human intellect, to belong to an active, thinking partner, not to a ventriloquist's cast-off. Many times now, the round silhouette of Bill's head had been transmitted by this strange equipment, with eyes and nose showing as black blobs—but there had been no gradation, nothing between white and black, on the receiver screen.

Baird went to the receiver, bent down, stared into the viewing box. At first, there was only a confused pink glow, streaked with black bars. There was always a few seconds of this while the apparatus warmed up, while receiver, transmitter got into "sync". After this, there would be Bill—just a black-and-white shape.

Suddenly the picture locked, the bars vanished, and Baird gasped. There Bill was. Bill in his box—but not just a black-and-white outline, an infant's drawing: he was there, every feature recognizable, eyebrows thick and curving, head correctly rounded. And he was wearing his grin—but this afternoon it was a grin of triumph.

John Logie Baird had achieved a real "television", a seeing-at-a-distance. But, of course, this was not enough, far from it. Bill was all very well, Bill had seen him through much, but Bill wasn't human.

Baird tore down the steps to the floor below and burst in on William, the office boy of the firm which rented the floor. William was sorting envelopes and he looked up now in some surprise as the mad Scots inventor, hair flying in the wind, rushed up to him. "Yes?" said William, with dignity. "What do *you* want?"

"Most important. *Most* important. I've made a discovery and—and you've got to come upstairs——"

"Look—I'm busy——"

"Never *mind*! COME UP."

Shaking his head, William followed the inventor up the stairs and there Baird led him to the chair on which his namesake was seated. A flick of the wrist, and Bill was on the floor, grinning at the ceiling. A moment later William was in his place. "Sit still—that's all. *Sit still*——" Baird tore into the next room.

But this was dreadful. A moment ago there had been a picture. Now there was nothing. Frantically Baird adjusted his tuning, his focus, his voltages: the screen remained blank. Could he have been dreaming? Back he ran; then he bent to pick up the ventriloquist's dummy, put him in the boy's place, find out why Bill came through, William didn't.

Now he saw what was wrong. Bill was wooden, Bill didn't mind the heat (though he'd been singed more than once). William didn't like it; the heat, the tremendous light in his eyes; and he'd moved back.

Baird gave him half a crown, got him into focus, promised it wouldn't take long, rushed to his receiver.

This time the office-boy was there: puzzled, indignant, but there, with every part of his round face clear and in focus, correctly shaded.

He was unimpressed, this young man whose face was the first to be seen on television, and who, a moment later, when they reversed rôles, became the second man in history to see television. He went back to his envelopes.

This was what Baird had needed; he was bursting with excitement. As an engineering apprentice in Scotland who had tried his hand at business and failed, was getting back into technology by becoming an "inventor" while his health recovered from the chain of illnesses which had destroyed his business career, he had needed a breakthrough like this. Now he *knew* he was on the right track, that television was here. No need now to go back to making and marketing "The Baird Undersock" or guava jam. He began to work even harder. At last, in January, 1926, when his equipment had been much improved, he issued a reckless invitation to the Royal Institute in London, urging it—all of it—to attend a demonstration.

He was shocked at the number which turned out, and they were shocked at the smallness of his premises; but eventually, in doses of six Institute members at a time, the demonstration was performed for all. Bill's face and a number of human ones—faces of distinguished scientists, each more puzzled than the last—were transmitted from one room to the next. This, the scientists agreed, was incredible. Silhouettes had been transmitted a number of times, it was an amusing laboratory demonstration; there had never been any possibility of sending a picture. Yet here it was. The young Scots businessman, for this is what he had always considered himself, the poor boy from the Helensburgh manse who would make his fortune in England—John Logie Baird had demonstrated television.

The next step was to send these visual images over a distance, and now Baird received welcome help from the Chief Engineer of the B.B.C. The picture was sent along telephone wires to a B.B.C. studio and then put on the air by a B.B.C. transmitter. Baird picked it up on a receiver in his own Frith Street laboratory and was overjoyed to find his picture "practically unaltered" by what the B.B.C. had done to it. There were objections, though, to the continued use of a B.B.C. transmitter and Baird now applied for and got the first television transmitting licence ever issued: 2TV. He had very little money, but he was able to move to slightly larger premises near Leicester Square and to install receiving apparatus at Green Gables, a house in Harrow, some ten miles distant. His picture was received over the distance and now Baird, flushed with success, ambition, formed with a few partners "Television Limited". Early in 1928 they were able to transmit a crude picture over the Atlantic and a month after that to send one to the liner *Berengaria*, causing excitement—consternation—among her passengers.

But money is often the problem. As Baird wrote in his memoirs: "If an inventor reads these pages, let him by this be admonished to do what Graham Bell, inventor of the telephone, did, and sell for cash. Inventors are no match for financiers where stocks and shares are concerned, and will if they hold on find that the financiers have the cash and they have the paper."

These are bitter words and certainly John Baird, though his name is a household word, made little money from his invention. Partly through his lack of business ability, partly through bad luck, he found others reaping the benefit of his work. When he died in 1946 he was not the rich man he had hoped to be. It has been said that he "sold himself to Mammon" too soon; if he had not allowed unsuitable people to take shares in his invention at an early stage he would have retained greater control over it, might have convinced John Reith, the first head of the B.B.C., that this was a discovery which needed to be used, and used soon—which was not a commercial stunt. As it was, the B.B.C., after taking many years to work up an interest in television, finally settled on another system which had been developed after Baird's.

The idea of sending pictures through the air had been in inventors' minds for years, ever since Marconi had sent the first wireless message; and considerable thought had been devoted to the subject. Paul Nipkow had invented his "Nipkow Disc" which was the foundation of all TV experiment. By punching holes in a certain way round the periphery of a cardboard disc, Nipkow found he could illuminate an object in front of the disc with a light from behind, illuminate it in a series of points of light which "scanned" the object from top to bottom and from side to side. If this illumination of, say, a human head could be picked up by a light-sensitive device, a "photo-electric cell", the consecutive points of light, each of a varying intensity, depending on the light and shade of each part of the face, could be sent along a wire as separate electric pulses, of different strength. If these pulses could then be converted back into light, through a bulb, and reconstituted, by a similar disc, in the right order, a picture could be built up, and displayed on a small screen. If the two discs revolved fast enough to make use of the eye's natural persistence of vision, the picture would appear complete: not as a series of dots.

Nipkow's apparatus was too primitive to transmit anything recognizable, but the principle was sound, and it was this that Baird, with immense concentration, set out to develop. He worked out a plan of scanning so that the dots moved from left to right in



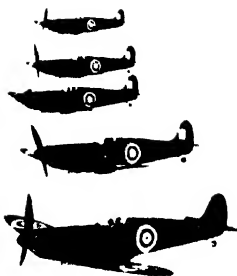


Immediately on obtaining power in 1933, Hitler set himself to secure the abrogation of all the clauses in the Versailles Treaty of 1919 which imposed limits on the development of German military strength. Within two years he felt strong enough to declare his intention to re-institute conscription and enlarge the armed forces. The feeble reaction that he was encouraged to attempt the partial occupation of the Rhineland. The demilitarization of this frontier region had been insisted upon by the French at Versailles, but Hitler, trusting to his genius, was sure that the time was safe to call their bluff. At dawn on 7 March, 1936, a small force of German troops entered the Rhineland, and the enthusiastic reception they received (as shown in this photo) paved the way for an occupation in force. Years later Hitler admitted that the first forty-eight hours after the re-occupation were the most nerve-racking in his experience.



The Battle of Britain, fought in September, 1940, was one of the decisive battles of the world.

*Here.* Some of "the Few" dashing from their lorry to man their Spitfires against the approaching enemy. *Right.* A formation of Spitfires cruising line abreast. *Below:* On the coast of France, Goering and his Air staff officers look across the Channel to the white cliffs of England, above which the tremendous battle is being fought (German photograph).



horizontal lines (his first experiments were with thirty horizontal lines: the B.B.C. now uses 625) which would fill up a "frame", and the frame itself would be swept away to make way for another, many times a second, like successive pictures in a ciné film.

He experimented with scanning discs, different numbers of holes, different speeds of rotation; and with different photo-electric devices. Others were working along the same lines, but Baird was out in front, and to him rightly belongs credit for having shown the first real television picture. A plaque in Hastings marks the house where, in 1924, having retired there as a young man to recover his health and finances by "inventing something", he first transmitted the silhouette of his Maltese Cross. At this stage the American Tenkins, and inventors in France and Austria, were well into the race, had done this sort of thing already. But from this first encouragement Baird leapt ahead, outstripped them all.

From the mechanical method of scanning, with refinements of the Nipkow disc, television progressed using the cathode-ray tube, which had been developed for a different purpose, and Baird, like others, was quick to see its advantages. Instead of moving a beam of light mechanically, by projecting it through holes in a revolving disc, the cathode-ray tube moved a beam of electrons with a pair of magnets and this could be used to scan—indirectly—the object being televised and to light up the front of the tube in synchronization with it. This system is now universal. Baird went on to experiment with projection television, where the picture is thrown on a large screen in a cinema, and with colour television, where he has left a mark on all the systems in use at present.

He calculated that if he changed "frames" three times as often, he could interpose a revolving screen with the three primary colours, and in effect transmit each frame three times, in the three colours. A receiver on the same lines could build up a coloured picture from it, and he produced an apparatus with an astonishing fidelity. He worked, later, on a system where the coloured disc was replaced by three superimposed pictures in the three primary colours, and it is this principle of separate transmission of colour components which is used in all of the methods of colour transmission—many of them still experimental—in the world to-day. The obstacles in the way of universal colour television are the expense of building suitable receivers and the reluctance of countries to saddle themselves with a system which may be incompatible with that in other countries.

If a standardized method of colour transmission were adopted

all over the world, mass-production of receivers would bring the price down to an attractive figure; but this is highly unlikely in view of the fact that, even with black-and-white television, there are several "line-standards" in use, none of them compatible. In Britain, both 405 and 625 lines systems are in use; there are others in America and on the Continent. In theory, the higher the number of lines, the better the definition of the picture, but there are other factors which make this only a rough guide. Obviously, though, the old Baird picture of the office boy from downstairs, with its thirty horizontal lines, each clearly separate from its neighbour, is a far cry from the modern B.B.C. picture with 625 lines, too close together to be detected.

With high-definition television already here, colour television just around the corner in Britain and a practical proposition in some other countries, the next developments seem to lie in the transmission of pictures over a great distance. It seems strange that though John Logie Baird sent a picture across the Atlantic as far back as 1928, we are unable, without using satellites in space, to do the same now. The answer is that we could, of course, send a thirty-line picture like Baird's, just as he did, on a long wavelength, which would follow the curvature of the earth. For the higher definition of to-day's television we have to use very short waves indeed, and these, except in freak conditions, will only travel in straight lines like light, and refuse to sink over the horizon. To get ultra-short-waves from Britain to America we must project them into space and bounce them down again at the right spot, and though this technique is in its infancy there have been many good examples. Perhaps the most important occasion was the funeral of President Kennedy, when the procession as it actually took place in Washington was seen by British viewers.

T.V. has made great strides since John Logie Baird, the semi-invalid from Helensburgh on the Clyde, first showed an office-boy's face—but had he not done so, it would have been many years before the rest of us saw television.

## *Rutherford's Discovery*

### *The Fantastic Power in the Atom*

THE SUN has scarcely risen. Here and there its almost horizontal beams slip through the gaps in the eastern range of mountains, mountains like jagged teeth, purple, eroded, teeth, with sudden, unexpected gaps between. The mountain shadows stretch halfway across the barren plateau—apart from them, there is nothing to be seen, but a windswept, dawn-chilled desert.

Then the sun catches a slender mast in the exact centre, a silver needle, gleaming now in its beam, like a vertical strip of fluorescent lighting. Dwarfed though it is by the vastness of the plateau, the mast is a hundred feet high, and whipping in the wind.

The sun moves; the needle vanishes. It has seemed, in the few seconds it was visible, rather like a woman's hat-pin, with a neat black bulge at the top. Were it not for this bulge, this blob, at the top, one could take it for a wireless transmitting aerial. A long-distance one: there are no listeners here.

At exactly five-twenty, the most terrifying and incomparably the biggest thunderstorm the world has ever known, breaks loose above the lonely plateau. A cloud shoots vertically up, one, two, five, seven miles into the sky, and a ball of solid fire—a million lightning flashes bundled into one—explodes. A noise louder than ever before heard on earth echoes away across the barren lands of New Mexico.

It is 16 July, 1945. Man has unleashed the atom. A new era has dawned with the sun over Alamogordo—an era which will lead either to unprecedented riches and prosperity for all the world, or to the total destruction of that world. Man himself holds the key.

But all this is in the future. For the moment it is enough for the scientists, watching and measuring through systems of mirrors ten miles away, to know that the Second World War, which had bled mankind for almost six long years, is as good as over. For there are three of these terrifying devices—or were until a moment ago—and the United States possesses them all. Within a month the second will drop on the Japanese city of Hiroshima, destroying it completely,

with thousands of its inhabitants; days later, the third will do the same for Nagasaki.

*Atomos*—the Undivided. So the Greeks called it, and the name Atom has persisted, even though we know the atom can be divided, torn down into its separate components, rebuilt in another form. The dividing of the undividable has in fact become almost a commonplace—and at the same time, the greatest single practical development in Physics, and in Chemistry, just as Einstein's Theory of Relativity—closely related to it—is the greatest theoretical stride forward since the time of Newton.

Till the end of the nineteenth century, scientists were able to regard the atoms of the various elements as completely stable particles. It was true that hydrogen was a very different substance to copper, that mercury bore little resemblance to sulphur or iron, and that therefore the internal arrangements of their atoms—the hydrogen atom, the copper atom, those of mercury, sulphur and iron—must be different, one from the other. Yet no power on earth could take those atoms apart, to find out what went on inside.

Then, in 1902, Ernest Rutherford, the New Zealand-born scientist, showed that various heavier elements like uranium, thorium and radium, which had been observed to emit a kind of radiation—like the luminous hands of a watch—were in fact breaking up to form atoms of a different sort. Uranium and the others, then, were *not* stable; they broke up, spontaneously, formed other elements.

The old dream of the alchemist was revived. If this transmutation could happen with a few, little-known, elements, could not, for example, lead be turned into gold, iron into silver?

To Ernest Rutherford, though the thought was amusing, there seemed more to his discovery than this. He pressed on over the years, forcing the atom to give up, one by one, its closely guarded secrets. Many scientists have been involved in atomic research, but it is Ernest Rutherford, later Baron Rutherford—he died in 1937—to whom we owe credit for most of what we now know.

In 1895 the young New Zealander had won a scholarship to Cambridge and went to work there under the famous Professor J. J. Thomson in the new and splendid Cavendish Laboratory. It was an exciting time to start: a month after Rutherford put on his white overall for the first time, W. K. Röntgen produced in the laboratory a form of radiation, which for want of a better name he called an "X-ray", and which seemed to penetrate all but the heaviest matter. If he placed his hands on a piece of photographic film, in the dark, and then directed these rays downwards on to the

hand, he found he had taken an astonishing picture of the *inside* of the hand, bones, flesh and all.

Then, a few months later, A. H. Becquerel showed that uranium compounds produced, spontaneously, radiation much like Röntgen's rays. A year later, Thomson himself proved the existence of the long-suspected electron. Now the theory which men like Thomson and Rutherford had nursed for so many years, that all matter had a common origin, was built, as it were, from the same tiny and identical bricks, became a probability. The atom itself must be composed of these tiny electrical charges, but as the electron had been shown to be—always—negatively charged and to move in the direction of any positively charged object, like the positive pole of a battery, whereas the atom normally had no charge, it was obvious to Rutherford that these electrons must be balanced, within the atom, by other, positively charged, particles. It was some years before he established the fact, with his Nuclear Theory.

In the meantime he went on from Cambridge to Canada, where he had been offered, at the age of twenty-seven, a Professorship at McGill University. His fame spread and soon young men from all over the world came to McGill to work with him. One of the most brilliant was the Englishman Frederick Soddy, and with his help Rutherford in 1902 put forward the revolutionary theory that "radio-activity is a phenomenon accompanying the spontaneous transformation of atoms of radio-active elements into a *different kind of matter*". He based his theory on the observation that radio-activity was quite unaffected by heat, cold or chemicals, and the vastly more important one—which ultimately produced the bomb—that "radio-active change is accompanied by an emission of heat of a *quite different order of magnitude* from that accompanying chemical reactions".

In fact, as was later proved, each atom produced three million times the energy it might have yielded in a chemical reaction like burning. The new theory was treated with scepticism: it cut right across the long-held theory that all matter is indestructible. Then, three years later, in 1905, Albert Einstein, in a deduction from his Theory of Relativity, showed that there is no essential difference between Mass and Energy and that, as Rutherford had stated, the transformation of a very small Mass would result in the production of huge quantities of Energy.

In 1907, Rutherford decided to accept an offer to return to England and work in what was considered the world's most up-to-date laboratory, the new one at Manchester University. Here he

proved that one of the three forms of radiation emitted by radio-active elements (which had been given the names of *alpha*, *beta* and *gamma* radiation from the first three letters of the Greek alphabet), the radiation of *alpha* rays, was in fact a stream of actual atoms. The heavy, radio-active, element radium was emitting a high-speed stream of atoms of a lighter element, helium, and these were positively charged, as if one or more electrons had been removed. He showed that 136,000 of these helium atoms were ejected every second from one thousandth of a gramme of radium. In an experiment with a piece of radium sealed into a thick glass tube he was able to show the helium arriving as if by magic on the outside of it.

As in Canada, he found men flocked to join him, work under him, and with their help in Manchester he was able, in 1910, to propound his Nuclear Theory—that nearly all the Mass of an atom is in the nucleus, the small, dense centre, and that this is positively charged, with positive “protons” balancing the negative charges of the electrons circling—at a relatively great distance—around this nucleus. The *alpha* particles from radio-active elements could, if they collided directly with the nucleus of any atom, transform that atom into a different one, by altering the number of its electrons and the balancing “protons” which were in the nucleus. But as Rutherford had shown, *alpha* particles have a positive charge and they are therefore repelled by the positively charged nucleus. For this reason very few of them, however forcibly they are emitted, succeed in penetrating an atomic nucleus.

Then in the 1930s the scientist Chadwick and others showed that if *neutral* particles, carrying no charge, which were believed to exist within the nucleus, alongside the protons, could be isolated and used to bombard an atom, they would not be repulsed by either the positive nucleus nor the circling, negatively charged, electrons surrounding it. When a neutron struck an atom it would pass through these “planetary” electrons and right into the nucleus—if it were aimed correctly.

Neutrons, because they could not be attracted in any way, by either positive or negative forces, were hard to obtain, but eventually it was done, and a whole new field of “atom-smashing”, by “neutron-bombardment”, was opened up. But, until 1939, though the term “atom-smashing” was used, man had only succeeded in knocking out one, two, perhaps four, particles. Then in that year a German woman scientist, Lise Meitner, discovered that if uranium were bombarded by neutrons, the uranium atom appeared to be actually splitting—breaking in half.



Scientists all over the world repeated her experiment, proved it correct. A new kind of nuclear behaviour had been discovered: the nucleus was not merely being chipped it was being split. The behaviour was named "fission".

Soon, experiment showed that a rare form of uranium, given by scientists the number 235, to distinguish it from the more common uranium-238, would split extremely easily. Calculation showed that every uranium-235 nucleus that underwent fission would produce seven thousand times the energy of the neutron that made it break in two.

But this was only the beginning. Heavy nuclei need neutrons to keep them together (the lighter ones, like that of hydrogen, have no neutrons at all). When a massive uranium-235 nucleus breaks into halves, it no longer requires all its neutrons. Not only does the break-up produce, as we have seen, seven thousand times the energy of the neutron that caused it, but it liberates two or three neutrons to go on and do exactly the same thing to other nuclei—and so on.

The "chain reaction" producing the enormous destructive energy of the atomic bomb. And, properly controlled, the slower, longer-lasting energy of the nuclear power-station.

But, even in 1941, this, though understood, was only a pipe-dream. Then Albert Einstein wrote President Roosevelt that, with the United States now in the war, she could not allow the enemy to develop this possibility of uranium fission into a weapon. She must do it first.

Roosevelt—and the British Government which had encouraged a good deal of independent research into the matter—agreed wholeheartedly and the "Manhattan Project" was born: a secret research programme, costing over its three and a half years some two thousand million dollars, and culminating, in July, 1945, with the test bomb over New Mexico. The problems were immense. It had been discovered that fission went on spontaneously in the rare uranium-235, but that—fortunately for the experimenters—most of the neutrons liberated in a small piece of it found their way through its sides without striking nuclei. There must, though, be a "critical size", when the quantity of uranium was so great that there would be enough neutrons hitting nuclei to allow the chain reaction to proceed, become self-supporting.

The critical size was calculated. Then, a sufficiently large quantity of 235 had to be separated from uranium-238, an immensely complicated and slow process. Now if two pieces of 235, smaller than the critical size but, together, larger, could be pushed together, the

chain reaction would begin—the bomb would explode, go on exploding until all the uranium-235 had disappeared. But as the electron charges of the uranium atoms would tend to repel each other, the two pieces of 235 would have to be forced together at a speed approaching that of a bullet through the air.

They were. The bomb worked.

Since the bombs over New Mexico, Hiroshima, Nagasaki, a newer and much more powerful weapon has been developed, using, like this fission-bomb, a nuclear reaction. Scientists had long believed that if it were possible, instead of breaking down a heavy atom, to make two light ones fuse together, the amount of energy released would be far greater. Notwithstanding Rutherford's theory that radio-activity was not affected by heat, it was believed that the millions of degrees which were produced by atomic fission *might* force light atoms, like those of hydrogen, to fuse together and form heavier ones, like those of helium.

This was so—and within a few years the United States, using an "ordinary" atomic bomb as a trigger, had detonated its first hydrogen bomb over the Pacific. A few years after that, the Russians had developed their own and the two great powers could sit back, conscious that each had power to wipe out the other, that one "H-bomb" from either side could destroy most of a city, and that, apart from the blast and the heat which would do the initial damage, there was the third, insidious threat of "fall-out", when the products of fission and fusion, deadly gamma rays, began to settle earthwards after the bang. These would be likely to wipe out even more of a population than the other two. And if the hydrogen bomb were encased in the element cobalt, the fall-out would be many times more lasting, more lethal. It wasn't hard to see that a very few bombs might wipe out the whole of the human race.

For the first time in history, man had to consider the ultimate wisdom of war—war which he might win or lose, but which, in either case, might destroy him and his descendants for ever.

Better perhaps to sit in peace, in the light of a hydrogen bomb 93,000,000 miles away. For that, he now discovered, was the source of his sunlight. The reason the sun never "burnt out", as scientists for a thousand years had predicted it would, was that it was one vast and continuing hydrogen bomb explosion, with the release of huge quantities of heat and light caused by the loss of only a very small amount of matter—leaving enough to warm him for millions and millions of years to come.

Better sit back and enjoy it.

# Penicillin

## *A Victory Over Death*

IT WAS in France that the idea came to him, came during the noise and stench and dying of the trenches. The young Alexander Fleming, a trained and unusually promising bacteriologist, and therefore "reserved", had surprised his friends and colleagues by volunteering for the trenches in 1914. He was shipped over, as a lieutenant in the R.A.M.C., and soon the wounded were coming into his hospital, hundred upon hundred of them, their wounds crawling with bacteria—and he realized, to his dismay, that there was little to aid them.

"Surrounded by all those infected wounds," he wrote later, "by men who were suffering, dying, without our being able to do anything to help them, I was consumed by a desire to discover, after all this watching and waiting, something which would kill those microbes——"

And in his heart he knew that "something" would have to be a something which would help the body's natural defences. The antiseptics then in use were worthless. Not only did they do nothing to prevent, for example, gangrene, they actually seemed to promote its development. For a surface wound—but there were few of these—they had some slight value: they destroyed the bacteria and, with them, because the wound was on the surface, only surface cells, which could be replaced. For deeper wounds, they were worse than useless, destroying irreplaceable tissue and at the same time seeming to destroy the body's natural power to resist infection.

But the war ended in November, 1918, and two months later Alexander Fleming was demobilized, without having found an answer to the problem.

But he was thinking—he never stopped thinking—along the right lines. He knew that his substance would have to be something—perhaps from the body itself—which would *encourage it to kill invaders itself*, and three years later, in 1921, he took the first step forward. He had tried various human secretions and now he found that human tears, dropped into a culture of bacteria, dissolved them

with startling speed. The substance in the tear-drop which had this effect he named "lysozyme" and he soon discovered that it was contained in nail-parings, hair and skin and even in certain leaves and stalks of plants.

Unfortunately, the lysozyme, so powerful against some bacteria, had practically no effect on the dangerous ones. Its immediate use was therefore limited; but it was, as we now realize, a tremendous step forward in bacteriology. Fleming read a paper on it to the august Medical Research Club in December of 1921 and was distressed when it got a chilly reception. Eight years later, he was to get exactly the same frigid reception for his first discovery of penicillin.

During those eight years, Fleming never stopped his research into that pet theory: that something from the human body, something living, was the answer to bacteria. Lysozyme, though it never became a practical proposition, seemed to prove him right.

Could lysozyme be improved, treated in some way to make it attack dangerous bacteria with the force it launched against harmless ones? Or would some other substance be the answer?

The answer came—quite suddenly—in Fleming's London laboratory. The lab was bursting with bits of equipment—bunsen burners, crucibles, pipettes, test tubes, Petri dishes full of colonies of bacteria ripening for examination under the microscope, rubber tubes, glass jars. During the day, the cover had been taken off some of the Petri dishes to enable them to be studied under the microscope and now, as the Scots bacteriologist chatted to a young English visitor, he lifted the lids again, one by one and looked in. Several of the cultures, he noticed, had been contaminated by mould, but this was a common occurrence: the air was full of "spores" and when the tiny reproductive organs settled in a damp place they would proliferate, put out shoots in every direction, like a strawberry plant, become a fungus. It was tiresome, Fleming admitted, but that was all. "As soon as I uncover one of these dishes," he said, "something just drops out of the air. Right into it."

Suddenly he stopped talking. He bent over, looked carefully into one of the dishes.

On the surface of the culture of staphylococci which he had been breeding there was a growth of mould. It seemed exactly like the mould on practically all the other dishes, but on this one, round the edges of the fungus, the colonies of staphylococci had disappeared—vanished. If he looked carefully, he could see them, but, instead of being an opaque mass, they were simply drops of dew.

He picked up a small piece of the mould with his scalpel, put it in a test tube. To the younger doctor with him there was nothing at all surprising about the fungus and its effect on bacteria: the same thing would have happened, the bacteria would have been killed, if someone had dropped strong acid into the dish. Probably the fungus was exuding some acid. After all—it was easy enough to kill bacteria in a dish. The problem was to kill them in the human body, without killing the body in the process.

"This," said Fleming, "is really *quite* interesting." He scooped out the rest of the fungus, put it carefully into another test tube, corked it. Then he turned round, resumed the conversation.

"What struck me", the young man was to write later, "was that he didn't confine himself to observing, he took action at once. Lots of people observe a phenomenon, feeling it may be important, but they don't get beyond being surprised."

The next day, Fleming began to cultivate his mould. He took it from the two test tubes, spread it on a larger bowl of the nutritive broth which the laboratory used for breeding bacteria. The fungus grew, incredibly slowly, pushing out tentacles across the surface of the broth, becoming, centimetre by centimetre, a thick, soft, pock-marked mass of green and white and black. Fleming watched it for several days. Then, quite suddenly, the broth itself, having been a clear liquid, went a vivid yellow. Now he took a drop of this yellow liquid and placed it at the centre of the dish on which he had arranged, star-fashion, half a dozen different colonies of bacteria, each arm of the star being a different bacteria, streptococci, gonococci, staphylococci, and waited.

Breathless, he watched. Then slowly the colonies of bacteria—all of them—began to dissolve. Soon there was only the dew he had noticed before.

And now he knew—for these were serious, dangerous and even deadly bacteria—that he had found the answer to his problems. Lysozyme, his great hope of a few years back, had been almost useless against them. Ordinary antiseptics and disinfectants killed them, and killed the patient as well. This—and he was so sure of it he drank half a glassful—was a harmless substance. While he waited for any reaction he busied himself diluting the liquid and testing each dilution, from half-and-half to one part in five hundred. Still—though more slowly—it went on, killing bacteria.

It was important now to find out what the mould was, if he were ever to get any more of it, rather than having to rely on the slow breeding of the original spore which had landed on his bench. He

knew almost nothing of mycology, the science of fungi, but he studied it, enlisted the help of experts, and soon was able to establish it as "*penicillium notatum*"—a penicillin, or fungus, of the "*notatum*" variety.

The problem, though, was to get more of it. A second problem, and more intractable, was getting the yellow liquid into a stable enough form to be stored and used when necessary: it lasted only a short time before degenerating into an inert, useless, liquid. These two problems held up the development of what Fleming knew was a wonder drug for over ten years. In the meantime, because he was unable to produce enough of it to demonstrate anything worth while, men scoffed at him.

From the day the spore blew in through Fleming's Paddington window, he and others who believed in him never stopped working on the extraction and stabilization of the drug. Fleming was able to perform several minor but miraculous cures with the small quantities he was able to prepare, but there just was not sufficient to embark on a major test.

By the outbreak of war in 1939, ten years after the initial discovery, penicillin still could not be produced in adequate quantity or made stable. It had to be prepared from the mould—the pitifully small quantity of mould—for each treatment. Then, with government backing, a small team under the Australian Howard Florey got together in Oxford and determined to solve the problem. Gradually they found they were able to purify small quantities of the mould by a complicated method of evaporation, and the time came to try this new drug on a patient with something more seriously wrong with him than the boils and surface infections which Fleming had managed to cure.

News came that an Oxford policeman was dying of septicaemia from a small scratch at the corner of his mouth which had infected the blood stream. On 20 February, 1941, an intravenous injection of the purified penicillin was given to the dying man and thereafter every three hours. At the end of twenty-four hours the improvement was almost incredible.

Then, as Florey and his team had feared, the penicillin which they had laboured so long to produce ran out. The patient hung on for a few more days, but the microbes, no longer attacked by penicillin, seized the upper hand, and the man died.

The drug just had to be made faster. To this end, Florey made inquiries in America, and at last the Northern Regional Research Laboratory of Peoria, Illinois, agreed to help. They had been

working on uses for the organic by-products of agriculture and now, when they started work on the new drug from England, they discovered that corn-steep liquor, a by-product of maize, was an ideal medium for the growth of the penicillin fungus. They became enthusiastic, and within months Peoria was producing twenty times as much as Oxford. At the same time, they were on the lookout for moulds which might give a larger yield of penicillin. Up to now every gramme of the drug that had been made had descended from the spore which landed on Fleming's bench in 1929. Many experiments were made with moulds, but it was not until 1943 that the young woman the lab employed in Peoria to go round the markets cornering rotten fruit (they called her "Mouldy Mary") brought back a melon. The mould from this, a "*penicillium chrysogenum*", proved successful and remarkably productive. Nowadays, almost all the penicillin in use is descended from one rotten melon bought in the market at Peoria, Illinois.

At last the real value of Fleming's discovery was clear to everyone. Production, both in England and in America, mounted by leaps and bounds, and at first all of it was earmarked for the services. Thousands of dying soldiers, sailors and airmen were saved by the new Wonder Drug, and it was not until the end of 1944 that the military authorities felt themselves able to spare any of it for civilian patients. By this time the quiet, shy, sensitive man who had invented it had been honoured by his king and was now Sir Alexander Fleming. In the years before he died in 1955 he was showered with honours from every nation in the world.

Penicillin, the first of the "antibiotics"—substances produced by fungi or bacteria which inhibit the growth of other micro-organisms—was the biggest medical breakthrough in the first half of the twentieth century. It was and is startlingly effective against a wide range of diseases like pneumonia which had so often been fatal, and though it has no effect on the bacteria of, say, influenza and tuberculosis, other antibiotics, developed in the manner Fleming introduced, have been effective against these. The number of antibiotics—streptomycin, aureomycin, terramycin and numerous others—is increasing yearly. There is a danger that with too widespread a use of them, bacteria may become resistant; that some day the population may be exposed to an epidemic from a new and resistant strain of, say, tuberculosis. So far this danger has been kept at bay by the proliferation of new antibiotics which have ensured that most of the resistant strains of bacteria can be dealt with by another antibiotic to which they are not—yet—resistant.

## PENICILLIN

The discovery of penicillin completely revolutionized the treatment of disease. The young doctor of to-day can hardly realize how helpless his predecessors felt against so many deadly infections. The average expectation of life has increased so greatly that the whole structure of society is altering. All this simply because a research worker believed in the possibility of a certain drug—and trained himself to recognize it the moment it appeared.



## *The Statute of Westminster*

### *Commonwealth Emerges from Empire*

WHATEVER MAY be Great Britain's rôle in the future of world relations, she is assured immortality by the many institutions affecting the rights of man which she has either pioneered or invented. And of all of them, the British Commonwealth and Empire stands out as a unique phenomenon in the history of political institutions.

The British Commonwealth and Empire has as little resemblance to the great empires of Greece and Rome as it has to the more modern empires established by, say, France, Spain and Portugal. It contains not only a group of peoples of widely differing race and of every creed, but has within its orbit a variety of modes of government which surveyed overall provide an almost complete history of the British concept of man's rights, and his development towards his exercise of those rights. Side by side with great self-governing Dominions, which are as democratic in their constitutions as the Mother Country herself, are colonies governed more or less directly from Whitehall, dependencies, and protectorates, and all benefiting from the interplay of that special relationship which has been created and which operates on the same kind of basis that members of a family employ to regulate their relationships within the close circle of kinship.

The Commonwealth and Empire which exists to-day has no relationship with the first colonial empire which was dissolved by the Treaty of Versailles of 1783. This earlier empire dated from the great territorial discoveries made in the closing years of the fifteenth century, pioneered by the Portuguese, and by the Spaniards who gave their support to immigrant Genoese navigators of outstanding skill and courage. For simultaneously with the expeditionary voyages of Vasco da Gama and Christopher Columbus, the Cabot brothers, sailing out of Bristol, made discoveries scarcely less important than the Cape route to India or the existence of the Indies. But there was this difference between them: the Portuguese took advantage of the opportunities opened to them by da Gama, and the Spaniards of Columbus's discoveries, while the English

did not follow up the lead given by John and Sebastian Cabot.

It was only when the Tudors began to encourage their subjects to study the art of navigation that England began to take part in a renewal of the maritime enterprise which had been one of her main characteristics before the generally debilitating influences of the Plague took effect in the fourteenth century. The interest which was engendered during the early decades of the sixteenth century was further encouraged by the Reformation, which prompted opposition to the bigoted Catholic influence of Spain. This, coupled with a strong desire for wealth, and a resurrected love of adventure, provided further boosts.

So, in 1583, Sir Humphrey Gilbert founded a settlement in Newfoundland, and Raleigh did the same in Virginia. However, these settlements were not permanent, and it was not until 1606 that James I granted a charter to the Virginia Company for the colonization of the territory, which was initiated in the following year.

While it was economic considerations which underlay the colonization of Virginia, New England was settled purely as the result of the operation of religious prejudice. The 143 Brownists whom the *Mayflower* carried across the Atlantic in 1620 were seeking a refuge in which they could worship as they pleased away from the restrictions of those who disagreed with their religious views. These Pilgrim Fathers founded the colony of New Plymouth, while the great Puritan exodus of 1629 led directly to the establishment of Massachusetts, and the persecution of Roman Catholics, eight years later, resulted in the founding of Maryland. Largely as the result of migrations from Massachusetts, other colonies were founded, and it was thus that quite peaceably the foundations of the present United States were laid.

While this had been going on on the mainland of North America, an English settlement had been set up in the Bermudas, which had been annexed to the Crown in 1609. Between 1623 and 1650 settlements had been made in the West Indies in St Kitts, Barbados, Nevis, the Bahamas, Antigua and Monserrat. Then in 1650 came the first colonial possession by conquest—Jamaica, taken from the Spanish. This marked the beginning of a contest between the powers of the Old World for ascendancy in the New World.

This new policy was initiated when, under Cromwell, England was at the height of her military and naval power. The restored Charles II carried on what Cromwell had begun, with the founding of North and South Carolina, New Jersey, and New Netherland,

the latter being captured from the Dutch in 1664, and renamed New York. These were followed by Penn's founding of Pennsylvania in 1682 in the reign of James II, and then within six years the struggle with France, which was to last off and on for more than a century, was initiated with the accession of William and Mary.

The real crux of this long and bitter struggle from the English point of view was not whether French hegemony in Europe should be prevented from succeeding, but whether the English or the French should dominate North America and India. The Treaty of Utrecht, made in 1713, foreshadowed the final outcome of that struggle. By the annexation of Gibraltar and Minorca, Great Britain gained command of the Mediterranean, while the cession of Acadia, as Nova Scotia was then called, by France and her recognition of British rights in Hudson Bay was a significant pointer to the way the tide was running in North America.

The Treaty of Aix-la-Chapelle in 1748 settled nothing, though its aim, as affecting Britain and France, was to bring about an end to the struggle in India and North America, and within eight years the two powers were at one another's throats again. In this interim the French in America attempted to encircle the British colonies and cut them off from access to the West. Had their scheme succeeded the British would have found themselves shut in, perhaps for all time, in a narrow strip between the Alleghanies and the Atlantic, and might even have had to yield their foothold there. That disaster was averted by Wolfe's capture of Quebec in 1759. The resulting agreement gave the British Canada, and ousted France utterly from control in that area of the continent.

It is felt by some historical commentators that the removal of the French from Canada was a mixed blessing for the British. They argue that had the French remained in Canada and the Spanish in Florida—which had also been ceded to Britain—the American colonists might have protested against the fiscal policies of Westminster, but they would not have dared to take the action they did, for fear of being ultimately overwhelmed by these two powers when they had cut themselves off from Britain.

As to the reality, what began as a domestic quarrel drifted into a civil war, and the civil war expanded into a European contest. With the active assistance of France, Spain and Holland, and with the moral support of the League of Northern Powers, the thirteen colonies wrested their independence from a Britain hard pressed on three fronts—America, India and the Mediterranean.

By the Treaty of Versailles, signed on 3 September, 1783, Britain

was compelled to acknowledge the independence of the colonies, to return Florida and Minorca to Spain, and Tobago, St Lucia, Goree, Senegal and certain parts of India to France. Thus the first British colonial empire was virtually shattered.

If by a colony is meant a land occupied by Britons whose intention is to make it a permanent settlement, then after Versailles, Britain had only one colony left—Newfoundland. Canada was as yet a colony of Frenchmen living under the British flag, with a few British fishermen and traders in Nova Scotia, Prince Edward Island, and the Hudson Bay area. There were a few British settlers in the Bermudas and the West Indies, Gibraltar still gave Britain the entry and exit to the Mediterranean, and there were settlements at Gambia and on the Gold Coast, which had originally been Dutch. St Helena also remained to Britain, and in India Warren Hastings was successfully to foil French efforts to regain their position prior to 1763; but except for Newfoundland there was not a real British colony existing.

The French had first begun to take a serious interest in India in the first half of the seventeenth century. Between 1604 and 1666 they had established five companies there, and by the end of the century had firmly planted themselves in Pondicherry, the Ile de France and Réunion. When France and England, in the middle of the following century, became involved in their struggle for supremacy outside Europe, thanks to the genius of Clive and the valour of Coote, the English East India Company emerged triumphant in 1763. The destruction of the French military establishments in India left the field open for a contest which though not desired by the British, was nevertheless inevitable, between the Company and the native princes. It involved the whole of India, except Bengal, which Clive had already won for Britain at Plassey.

This contest was to last for nearly thirty years, during which some of the greatest names in British empire-building were active—Warren Hastings and the Wellesley brothers among them. One result of the mutiny of 1856 was the transference of the rule of the East India Company in India to the British Crown. Twenty years later Queen Victoria was proclaimed Empress of India.

Meanwhile in Canada a great change was being effected. When the American colonies seceded, Canada, though under British rule, was a French colony. After 1783 a large body of American loyalists, to whom the independent states no longer afforded a home, fled over the Canadian border, and to them the home government made generous grants of land and money.

Under one flag, one governor, one council, one code of laws and one constitutional system, there were now living side by side two peoples, one French and Roman Catholic, the other British and Protestant. Recognizing the difficulties this entailed, in 1791 Pitt brought in the Canada Act which divided the country into two colonies, the original French province of Quebec, and the more recent British province of Ontario. Each was to have its own Governor, assisted by a nominated Executive Council and a Legislature of two houses—a nominated council and an elected House of Representatives.

For a time this arrangement worked, but the fact that the Act of 1791 gave the local Legislature no control over the Executive led to ultimate conflict between the two which developed into armed rebellion. This led the home government to suspend the constitution in 1838, and to despatch Lord Durham to inquire into the situation.

The Durham Report remains one of the most important documents in the constitutional history of Britain's overseas Empire (see "The Durham Report"). Durham recommended the union of the two colonies, an increase in the number of the Legislative Council, a reform of municipal government, a civil list, and above all that the colonial Executive should be made responsible to the colonial Legislature. "The Governor", he wrote, "should be instructed that he must carry on his Government by heads of departments in whom the United Legislature shall repose confidence." This principle constitutes the charter of British colonial self-government.

In 1840 the Union Act was passed. In it there was curiously no mention made of the responsibility of the Executive, but the English Cabinet system was implicit in the new constitution. This was made absolutely clear when the Governor was instructed in 1847 to "act generally on the advice of the Executive Council" whose members must have the confidence of the Assembly. Thus the principle of responsible government was established for the first time in an English colony.

It is strange to think that American independence led directly to the founding of the second great power of the British Commonwealth. On gaining independence, the Carolinas refused to continue to receive deported British convicts. Australia, rediscovered by Captain Cook in 1769, appeared to offer excellent facilities for this purpose, and in 1788 the first ship-load of felons was shipped to the Antipodes and landed in Botany Bay. Such was the inauspicious beginning of the colony of New South Wales. In 1821, however,

the colony was thrown open to free immigrants, and so rapid was the growth of the free population that by 1859 four more Australian colonies had been founded. Meanwhile, New Zealand, in 1840, had been declared British.

Constitutionally the history of Australia and New Zealand is virtually a repetition of that of Canada. By an Act of 1850, New Zealand, New South Wales, Victoria, Tasmania, South Australia and Queensland adopted responsible government between 1854 and 1859, while Western Australia followed in 1890. In South Africa, fierce struggles with the natives resulted in the founding of settlements there. But the British had been early forestalled in South Africa by the Dutch, and a struggle between the two colonizing powers was inevitable. This came in the long-drawn-out contest which, after three years, in 1902 ended in the decisive defeat of the Boers.

Long before this, responsible government on the customary pattern had been granted to the older British colonies, and the agglomeration was finally welded into a whole in 1910. The union of the South African colonies was itself a variation of the movement for federation which had been gradually developing in Canada, Australia, and New Zealand, where responsible government had been found incapable of solving many important questions that confronted the colonies as they expanded. In 1867, Canada had become a federal Dominion under the British Crown, with a nominated Senate, an elected House of Commons, a Privy Council and a responsible Cabinet. But more than half a century was to elapse before Australia and New Zealand followed suit.

All this was of apiece with the assumption more generally accepted in England than in the colonies that it was the duty of the parent state to educate the dependent communities in political statecraft, and to maintain the fostering connexion only until the colonies were strong enough to stand alone. But the last twenty years of Victoria's reign witnessed the dawn of a new era in world history. European polity suddenly expanded into world polity. The rapid rise of Germany as a colonial power stimulated the spirit of imperialism elsewhere.

The British colonies were not slow to see that it would be in their interest to remain component and self-governing units within an Empire rather than to plunge into world politics as independent but relatively insignificant states. From 1887 onwards they began to be tentatively summoned to take their part in the councils of the Empire. A Colonial Conference in London coincided with the

queen's golden jubilee, while in 1894 and 1897 similar conferences met in Ottawa and in London, the latter being marked with a fervour for imperial unity.

Even greater progress was recorded in this respect by the meeting in 1902, when the colonial statesmen gathered to pay their homage to a new king. The fervour had somewhat abated when the conference next met in 1907, yet it registered two important stages in the evolution of the Empire: the conference changed its name to imperial instead of colonial, and it decided to meet regularly every four years.

But it was the participation of the dominions in the First World War which profoundly modified their status alike in the British Empire and in world politics. They passed from the position of protected colonies to that of participating nations. From this it was but a short step to the Statute of Westminster of 1931 which laid down the principle of dominion status. The Statute declared that the dominions are "autonomous communities within the British Empire, equal in status, in no way subordinate one to another in any aspect of their domestic or external affairs, though united by a common allegiance to the Crown, and freely associated as members of the British Commonwealth of Nations".

Never before in history has such an organization of nations existed; and none but the British genius could have given birth to it, nor brought to it the maturity and stature which it manifests to-day. No matter what the future may hold, if it can continue to uphold the principles by which it has functioned up to now, it cannot fail to continue to wield the tremendous influence for good in the affairs of mankind which has been its supreme achievement in the past.

# *The New Deal*

## *A New Era in Capitalism*

"WE HAVE always known", said Franklin D. Roosevelt at the beginning of his second term of office, "that heedless self-interest was bad morals. We know now that it is bad economics."

In 1932 Roosevelt had been elected President in a landslide victory by an America facing economic catastrophe. He had persuaded them that he could save the country and bring back prosperity. He gave them the New Deal, a vast imaginative conception of national replanning and reconstruction which changed the face of America and which had repercussions all over the globe.

The economists are still arguing about the New Deal, but there is little doubt that its revitalizing effect upon the American economy, and upon the American people, enabled that great country to meet the gigantic military and economic challenge of the Second World War.

The New Deal also marked the end of an economic era. There had been depressions in the past, terrible ones, but economists believe that there will never be another of the same magnitude as that which hit America and the world in the 1930s; for the experience of the New Deal has taught governments how to contain and alleviate the economic recessions to which all capitalist societies by their very nature are exposed.

The great depression had its roots in the First World War. Until 1917 the United States had kept scrupulously free from European entanglements. The Monroe Doctrine of 1823, combined with George Washington's warning against entangling foreign alliances, held until the end of the nineteenth century when the United States annexed Hawaii and assisted the Cubans to revolt against the Spanish rule. It went completely by the board in the First World War, for even though America teetered on the brink until 1917 it was busily trading with the embattled nations, particularly the Allies.

In Europe agriculture contracted sharply during the war and American farming expanded in order to fill the gap. In 1918 the



United States was exporting agricultural produce in vast quantities and their farming industry was at its peak. After 1918, however, agriculture in Europe soon got back on its feet, and the demand for American farm produce fell.

Instead of cutting back their output, the American farmers, by using more mechanization and less labour, increased their yield with the result that they were in serious trouble in the middle twenties with prices falling on an overburdened market.

While this was going on, other sections of the community were enjoying an unprecedented boom, for there was plenty of post-war leeway to make up. In particular the motor industry flourished, as did its dependent industries such as steel, rubber, oil and road building. Railroads and shipping were prospering. Capital investment was running at a high level. There was little or no unemployment; for most of the decade it was less than two per cent.

This prosperity was not confined to America. It was shared to a certain extent by the rest of the world. But the centre of wealth was now in America which felt itself on the crest of a wave, with exports, particularly of raw materials, growing healthily all the time. America granted extensive credits to other countries in order to boost its own rapidly expanding industries. It was during the twenties that it first became a great creditor country, and American money, American goods, American films and American know-how spread all over the world.

And so the great boom was on. America believed it had found the secret of permanent prosperity, despite the few warning voices which were raised.

American farmers, however, bitterly complained that they were not sharing in the general prosperity and their economic problems really lay at the heart of the trouble. In 1926 they were asking the government to come to their help by buying their massive surpluses of grain, cotton and tobacco, and there was a long administrative wrangle over farm relief.

Another disturbing feature of the boom was the fact that wholesale price levels were falling steadily. This was combined with enormous expansion and a rise in the value of stock exchange securities to heights which were out of all proportion to their true worth. It was this dizzy rise in stock exchange prices which finally broke the boom, and triggered off the remarkable economic collapse of 1929.

But these ominous signs were seen only by the few. The American people generally saw before them such golden prosperity and

wealth as had never before been dreamed. Everybody bought stocks and shares, the prices of which soared to incredible heights in the great bull market of Wall Street. Brokers' offices swarmed with crowds of investors, most of whom were people in ordinary jobs. Clerks, elevator-men and waiters outnumbered the capitalists in their rush to invest their savings in shares which they could sell the next day at a profit. Up and up went the shares. People mortgaged their houses to buy securities, the market value of which was ever increasing. It seemed that they could not lose, and that they had discovered the key to untold wealth. Shares bought one day were sold the next at a large profit which was immediately invested in more over-priced shares.

This fantastic over-pricing of stocks and shares was not based on profits or dividends, but rather upon a wave of business optimism which was founded on the delusion that the country had discovered the secret of permanent prosperity. Wall Street's tidal wave of inflated share prices was largely borne upon billions of dollars of margin accounts. There was far more money and credit available than there was trade. The stock market became an immense credit-inflated bubble, which was bound to burst.

The authorities were aware of the dangers of the situation as early as 1928, but they were unable to damp down the speculation fever in Wall Street. Warnings that the whole thing was a financial Tower of Babel set upon the most precarious foundations went unheeded. In fact the authorities expected a collapse, and thought that in some ways it would be a good thing.

But when it did come in October, 1929, they had no idea of the enormity of the approaching disaster, and that it would bring with it the biggest depression of the century.

Fortunes were lost overnight in Wall Street. Many ruined speculators committed suicide. Some are said to have leaped from the skyscrapers into the streets below.

More disastrous than the Wall Street collapse was what followed. Foreign trade fell, factories closed, banks failed, mortgages were foreclosed, commodity prices fell, and unemployment soared to alarming figures. The bottom of the depression was reached in 1932. By that time it was world-wide, and it was estimated that there were thirty million people unemployed in the world as a consequence of it.

The United States, with a total of fifteen million workless, was the centre of this great depression which moved outwards in waves which were felt all over the world. The contraction of American

industrial production, the cutting of dollar loans and investment overseas, spelt depression everywhere. The American economic problem was domestic and had its roots in the land. While the United States were unaffected by international changes in foreign trade, the reverse was the case in other countries who were therefore defenceless against the cold wind of the great depression.

It was to repair this economic sickness in the domestic life of the nation that Roosevelt was elected in 1932. At that moment the country felt itself on the brink of disaster, and the first thing Roosevelt did was to restore its morale. His eloquence and his confidence fired the imagination of the people in the same way as Churchill's did when Britain stood before another abyss in 1940.

During the week before Roosevelt took office in March, 1933, more than fifteen hundred million dollars had been withdrawn from the banks by panic-stricken hoarders. The day after he took office Roosevelt issued a proclamation closing the banks and putting an embargo on gold.

He then outlined his three objectives: restoring prosperity by "re-establishing the purchasing power of the people", bringing about a proper balance between the agricultural and industrial sides of the economy, and eliminating abuses and excesses from the American economic system. He took America off the gold standard, abolished Prohibition which had caused nationwide corruption and crime, and inaugurated an immense programme of public works.

The New Deal, given to America by Roosevelt and his famous Brains Trust, ranks as one of the greatest economic experiments ever made in a capitalist country.

The New Deal itself was a whole series of measures aiming at righting the economic wrongs. There was a New Deal for the farmers, for Labour, for Old Age pensioners, for controlling Wall Street. There was an anti-trust New Deal, a Recovery New Deal to "prime the pump" of the economy. The New Deal included great public works schemes of roads, housing, bridge and dam-building.

The greatest and most imaginative of these schemes was the Tennessee Valley Authority, an immense reclamation scheme for the benefit of the farmers of the Tennessee Valley, which was also aimed at providing new industries with cheap electric power.

As Roosevelt himself put it, he had faith that "we can make, by democratic self-discipline, general increases in wages and shortening of hours, sufficient to enable industry to pay its own workers enough to let those workers buy and use the things that their labour

produces". This was the core of his philosophy. This was what the New Deal was intended to do.

"The basic things expected by our people are simple," he said. "They are—equality of opportunity for youth and others, jobs for those who can work, security for those who need it, the ending of special privileges for the few, the preservation of civil liberties for all, the enjoyment of the fruits of scientific progress in a wide and constantly rising standard of living."

In June, 1933, Congress authorized the President to spend \$3,300,000,000 on public works to create employment. He was also empowered to enforce a code of fair competition in business practice. Workers were free to belong to a union of their choice.

This was the National Industrial Recovery Act (the N.R.A.), the most startling measure of the New Deal, for it gave the government power to control the entire industry of the country, to decide wages and hours and conditions of employment. The industries were not taken over, as in the case of Socialist countries, but representatives of it were invited to Washington to work out codes of business practice and fair dealing. This act aroused the implacable hostility of big business.

The farmers who had been in a state of near armed revolt in 1932 benefited most from the New Deal. In order to restrict output—for it was the collapse of agricultural prices in 1929–30 which was mainly responsible for the severity of the depression—Roosevelt gave farmers quotas and benefit payments for restricting output. Farmers were paid to leave land fallow. This had the side-effect of increasing productivity later, for it was good for the land.

The New Deal, although it revitalized the economy in many ways, and gave a very necessary boost to morale, did not all work smoothly, and was strongly opposed in many quarters. Roosevelt's genius lay rather in initiating than in executing. He had to rely on other people to carry out his inspired schemes. His Agricultural Adjustment Administration under Henry A. Wallace was a great success, but he was less fortunate with the N.R.A. which he hoped would raise both prices and wages and thus increase purchasing power.

This section of the New Deal aroused violent opposition from some sections of the community on both constitutional and economic grounds. The public complained of rising prices, and after a short period of recovery economic difficulties once more increased. In 1936 the Supreme Court held the N.R.A. to be unconstitutional, and Roosevelt's enemies rejoiced.

But in the November of that year the electorate returned Roosevelt to the White House for his second term with a sweeping majority which was a complete national endorsement for the New Deal.

Roosevelt had now fully earned the antagonism of big business. Some economists believe that it was this antagonism between big business and the government which held back America's recovery, as it had the effect of depressing business confidence and retarding investment.

From the first Roosevelt attacked Wall Street and its "heedless self-interest". Big business replied with an unyielding and lasting antagonism to the New Deal and the man responsible for it. Wall Street did not attempt to—and perhaps it could not—overcome the crisis itself by the working of the free market, and thus stave off the reforms which were forced upon it. Instead it waged something like a religious crusade against the New Deal and wanted to persuade the world that Roosevelt was practically trying to bring about red revolution, whereas the New Deal was no more drastic and radical than the legislation of the Liberal Government of 1906 in England.

The New Deal altered the face of America, and its repercussions were world-wide. It gave the rich and the privileged classes of America an even greater fright than the depression did.

Whether it solved the crisis and lifted America out of the great slump is even now being argued. By 1937 unemployment was still at seven millions, and although consumption had been stimulated by government expenditure, private investment was still stagnant. In 1939 war in Europe gave an unplanned, if anticipated, boost to industry.

The New Deal marked the end of uninhibited and uncontrolled capitalism. It showed that when a country like the United States faces serious depression, only the most drastic government action can save the economy. The New Deal has taught governments how to avoid such economic disasters as happened in the 1930s.

## *Hitler Enters the Rhineland*

### *A Great Stride Towards the Second World War*

AT NOON on Monday, 30 January, 1933, Goering, Goebbels and other Nazi chiefs are leaning out of a window of a room in the Kaiserhof Hotel in Berlin watching the Chancellery building where Hitler had gone to see President Hindenburg for the third time in a few days. The President was trying to form a government with a majority in the Reichstag and he needed the support of the Nazis who were, though they had just lost two million votes in the last election, the largest mass party in Germany, the Communists coming second.

Hindenburg had refused Hitler's demand to be made Chancellor. Would he give way this time? The watchers saw their trench-coated leader leave the building, but they could tell nothing from his face: a few minutes later he was with them, and his eyes glistened with tears as he announced the news: he was the Chancellor of Germany.

That evening, starting at five o'clock and lasting until midnight, huge processions of jack-booted Brown and Black Shirts bearing torches made the streets of the capital ring with their songs and slogans. It was not the first Nazi demonstration in Berlin; for Socialists, Communists and Jews it was the most sinister. Goebbels wrote that night in his diary: "It is like a fairy tale." And so it was, though a most unpleasant kind of fairy tale. An Austrian, of humble birth, without any formal education, who had passed his early manhood in the doss-houses of Vienna and Munich, who had served as a corporal in the First World War, had won the highest office, after that of the President, in the German Republic.

Germany for the past five years had been the scene of constant brawls between Communists and Nazis. There were six million unemployed. In the Reichstag there was no majority for any respectable government—Socialists, the Catholic Centre party and conservative nationalist groups had formed effectual coalitions. President Hindenburg did not want to call in the Nazis. Junker as he was, he respected his constitutional oath to support German democracy, and the Nazis openly said, "Democracy must go."

Many of Hindenburg's advisers disliked the Nazis' violent anti-Semitism and noted that even respected Catholic politicians had been beaten up by Hitler's thugs. However, when Hindenburg gave way, it was some consolation that the government contained only three Nazi ministers; Hitler and his two companions were surrounded by respectable conservatives who included the experienced diplomat Von Neurath and, as vice-Chancellor, the monocled Franz von Papen, member of all the best clubs and a close friend of the President. All could be well for the gentlemen of Germany who would keep the Nazi upstarts in their place. All the same, many of these gentlemen thought the Nazis had their rough hearts in the right places: they would suppress labour unrest.

The Army, in the early days, had financed Hitler's party, but in 1933 it was divided about the Nazis. Some generals didn't like the revolutionary slogans which the Nazis used, nor did they appreciate the existence of highly armed civilian organizations. Some military leaders, however, remained strong supporters. Hitler's first act on taking power was to win over the Army chiefs. He announced that a rearmament programme was to be started at once and that, in secret, for the Treaty of Versailles limited the German Army to 100,000 men, 36 divisions were to be created. The Army had asked for only 23.

It was not Army support which had brought the Nazis to power after fourteen years of struggle which had had its ups and downs. The Nazis had become the most powerful of the nationalist groups because they appealed, by their Socialist slogans, to the working class, and by their mystical ideas about Blood, Race and Soil, to a large stratum of the German people easily led astray by quasi-philosophical notions. For millions of Germans, Hitler's capacity for arousing hatred of foreigners, Jews and Communists, evoked, because of Germany's social disorganization, a huge response.

Hitler, however, appealed to the whole nation, particularly after he came to power, because he represented something practically all Germans were fervently agreed on: the Treaty of Versailles must be revised; Germany must recover her territory lost in the East and must no longer be treated as a pariah nation without a proper army. Here was real unity. A German government had freely signed the Locarno Treaty in 1924 which guaranteed most of the Versailles Treaty which had been imposed on Germany. But Locarno was regarded by the Nazis as an act of treachery.

Last of all, Hitler's triumph was due to his own genius. He had an intensity of inner passion, often possessed by small minds, but

always present in very great leaders. In his apparently wasted early years he had absorbed German and European history, taking to heart all the more exaggeratedly romantic ideas of certain philosopher-historians. Above all, in his strange way, this young man who neither drank nor smoked nor went after women, who, when he had money, would gorge himself with cream cakes whilst he devoured books and newspapers, had forged himself a philosophy not from books but from his contacts with fellow-tramps, with the "lower" races such as Slavs or Jews whom he met round the soup-kitchens of Vienna, and with political agitators and minor politicians. Only strength matters, not morality. Only the strong and ruthless survive in a hard world. Unimaginative, crude, with few normal interests or feelings—he loved his dog—he had created for himself a mind strong enough, at the age of forty-three when he became Chancellor of the Reich, to dominate all he came in contact with. There was something other than mind too. Hitler hypnotized not only with his oratory but with his presence, and this power remained with him until his end. In 1945, crouching in a bunker, in Berlin with Russian shells falling all around, German generals and civil servants who knew the war was totally lost still trembled, obeyed the Führer and, against all reason, left him believing that he might yet save them.

The world was to be dazzled by the achievements of the Hitler who annexed Austria, who smashed Czechoslovakia, who signed the Nazi-Soviet Pact and then directed the first victorious stage of the Second World War. His greatest achievements, however, were those between 1933 and 1936 when Germany was weak. Whatever illusions the conservative classes had about using Hitler, these were shattered rapidly.

Before 1933 was over he and his Brown Shirt Army had forced the Reichstag to pass what was called an "Enabling Bill to Protect the Reich from Distress", which in fact gave Hitler absolute power for four years, including the power of remaking the constitution. He proceeded then to centralize Germany, to abolish the governments of the various states such as Prussia (controlled by Socialists) and Bavaria, doing what Bismarck had never dared to undertake. All enemies of the régime were ruthlessly suppressed and the Jews were expropriated, kicked about and made to sweep the streets under the guard of storm-troopers armed with whips—when they were not being massacred. The persecution of the Jews gave great delight to Hitler, who laughed until he cried when told of the indignities heaped on his victims.



The power of the German trade unions was swept away. The workers were regimented in a way which would have been inconceivable in any other country. But the Germans liked discipline, work for rearmament was plentiful and pay packets were heavy even though "Guns before Butter" didn't allow many comforts. In 1934, Hitler, aware that the Army disapproved of some of his more revolutionary followers, conducted his great Blood Purge in which he personally saw to the execution of the most dangerous Nazi left-wing elements, led by the homosexual Roehm.

Hitler and his lieutenants with their hands still more stained with blood were regarded, after 1934, as respectable by the German officers and the middle-class. Foreigners were encouraged to visit Germany, for the régime knew how to keep its nastiness underground. Even those aware that many German intellectuals, such as Einstein, had already had to flee the country and who knew that German liberals disapproved of the Nazis, could not but be struck by the happy faces of the majority of the Germans who supported Hitler and by the air of purpose which now animated a once disorderly country.

It was in foreign policy that Hitler showed his genius at its greatest height during this period. This man who knew no foreign language and who had never been out of Germany proved himself the master of all European statesmen. Although the public reaction to the Nazis in some countries, particularly in Britain and America, had been, after a time, rather favourable, the Chancellories of Europe were well aware that Hitler nourished designs of conquest. After all, some people had read Hitler's strange book *Mein Kampf* which he had written in 1924 and in which he had exposed the aims of his policy if he ever became ruler of Germany. Then the rearmament programme could not be kept secret nor the construction of armoured divisions and aircraft. But the political and military experts who knew what was happening thought that Germany had a long way to go before she would be dangerous. Conscription was still forbidden by the Versailles Treaty and the Rhineland was still demilitarized.

Hitler's policy was, whilst preparing for war, to give the image of a Germany who wanted only peace and justice. He did both these things in no uncertain fashion. In May, 1933, President Roosevelt appealed to the European nations to disarm and in particular to abolish all offensive weapons including tanks and heavy artillery. Immediately Hitler made one of the cleverest speeches of his life. He said that President Roosevelt had earned the warmest

thanks of the German government. Germany was entirely ready to renounce all offensive weapons if the armed nations on their side would destroy their offensive weapons.

Neither Britain, France nor Italy was prepared to undertake real disarmament, particularly in view of what they knew of Hitler's plans. No response came from them to the American message and so in October, Hitler, playing the part of the just man who had done his best, who had himself breathed nothing but reason, sweetness and light, suddenly withdrew from the Disarmament Conference and from the League of Nations.

His next diplomatic moves astonished the world. Out of the blue, he concluded a Treaty of Friendship with Poland, the very country Germany was most determined to wipe out. To the naïve this seemed to dispel many doubts and fears about the new Germany. It also weakened the alliance France had made with Poland, Czechoslovakia and Yugoslavia. Hitler was also clever in the way he disentangled himself just in time from an unsuccessful *coup d'état* by the Austrian Nazis, to whom he had given arms and explosives solely to seize Austria.

In February, 1935, France and Britain decided to present Hitler with a suggested series of pacts against aggression by land, sea or air, covering all Europe. It put Hitler in an awkward situation for he was feeling that something must be done to encourage German nationalist sentiment. He welcomed the idea of a pact for Western Europe but was evasive over one covering the East. But he guessed that the British and French governments were nervous and needed more than he did to get some results. A British White Paper announced measures of rearmament in view of the now open German plans. The Führer contracted a diplomatic illness and refused to see Sir John Simon, the Foreign Minister, who had been coming to discuss the new pacts with him. The French announced a doubling of the period of service for conscripts. It was enough to give Hitler a sort of justification for the most sensational of his acts as yet. On Hero's Memorial Day, 17 March, 1935, he boldly proclaimed the ending of all the clauses against the German armed forces and conscription.

What followed? Empty protests by the Allies. Every German felt that Hitler had done what no Republican government would ever have dared to do. Even so, Hitler continued to play carefully his double-game. He kept on stating that Germany only wanted equality with other nations—which he had now got, and therefore wanted only peace. He reaped an immediate reward, for a few



On a Sunday morning in December, 1941, Japanese aircraft attacked the great American naval and air base at Pearl Harbour, Hawaii, without any declaration of war and, such was the inadequacy of the defence, without warning. In little more than an hour the base was devastated (*above*). Of the eight battleships in the harbour three were sunk outright, including the *California* (*right*) and in addition the *Oklahoma* capsized, her hulk may be seen on the extreme right of the photograph.





The Battle of Stalingrad was one of the great turning-points of the Second World War. For many months in the autumn and winter of 1942 the great city was the centre and object of the most bitter and primitive fighting, but in January, 1943, Field Marshal Paulus, commander of the German attacking force, was compelled to surrender.

*Here*, Fighting in a Stalingrad street. *Right*, Men of a workers' battalion defending their plant against the Germans. *Below*, Red Army infantry moving across the snow to attack enemy positions.



months later he was able to make an agreement with Britain which gave Germany the right to build a navy up to thirty-five per cent of the British. France and Italy felt that Britain had double-crossed them.

On 5 October, 1935, Mussolini, in defiance of the League of Nations and of Britain and France, invaded Abyssinia. Hitler was overjoyed. If Mussolini failed he would be weakened in Europe and so would not count; if he succeeded, he would be ready for an alliance with Germany. And so Hitler would finally be able to take Austria.

But before the question of Abyssinia and the League was settled Hitler made his greatest and most daring coup. As early as June, 1935, he had ordered the Reich Defence Council to prepare plans for invading the Rhineland. Under the Versailles Treaty, Germany was not allowed to build forts or keep soldiers in the Rhineland regions on both sides of the river. It was the only clause of the Treaty which still gave France a certain feeling of security. In drawing up plans Hitler ordered that nothing was to be typed or mentioned even on private telephone lines. General von Blomberg, the Commander-in-Chief, was frankly against entering the Rhineland, for he regarded a French counter-reaction as inevitable.

On 27 February, 1936, the French Parliament voted its approval of the mutual assistance pact between France and the Soviet Union. This was the excuse Hitler had been waiting for, and on 2 March he ordered the General Staff to prepare for immediate action on the occupation plans. The German Army was not even half formed or half trained; if the French Army with its ninety divisions marched, even a few of them, into the Rhineland and the Poles invaded from the East as they said they would do, Germany was finished. General von Blomberg gave orders that the occupying force was to be withdrawn at once if the French acted. General Beck, the Chief of Staff, suggested that Germany should voluntarily agree not to erect fortifications on the left bank of the Rhine, as a sop to the French. Hitler dismissed this suggestion with contempt.

At dawn on 7 March a small force of German cavalry and infantry entered the Rhineland, according to German witnesses at Nuremberg, the force was not more than three battalions or about four thousand men. At 10.00 a.m., Hitler summoned the French and British Ambassadors to see him and told them of the occupation due to France's breaking the spirit of the Locarno Treaty in making a pact with Russia, and he brought at once an offer of perpetual peace in Western Europe. At midday, at the Kroll Opera House,

Hitler addressed the German Parliament. With feigned emotion he spoke of his desire for peace with France, said that France had disappointed his hopes and had allied herself with an Asiatic power. Nevertheless, he continued, a way must be found for making peace. He had just offered France and Britain a twenty-five-year pact of non-aggression.

His audience who did not know what had happened, was tense and observant. Suddenly, when Hitler said: "As from to-day the German government has established the absolute and unrestricted sovereignty of the Reich in the demilitarized zone," there was an extraordinary demonstration. Shirer in *The Rise and Fall of the Third Reich* describes the scene as an eye-witness:

"Now the 600 Deputies, personal appointees, all of Hitler, little men, with big bodies and bulging necks and cropped hair and pouched bellies and brown uniforms and heavy boots, leap to their feet like automatons, their right arms upstretched in the Nazi salute. They scream 'Heil'. Hitler raises his hand for silence. He says in a deep voice: 'Men of the German Reichstag. In this historic hour, when in the Reich's western province, German troops are at this minute marching into their future peace-time garrisons, we all unite.' He can go no further. All the militarism in their German blood turns to their heads. Their faces are contorted with hysteria, their mouths wide-open, shouting, their eyes, burning with fanaticism, are glued on the new God, the Messiah. The Messiah plays his rôle superbly. His head lowered, as if in all humbleness, he waits patiently for silence. Then with a voice still low but choking with emotion he continues . . ."

The generals, however, at that meeting did not share the delirious enthusiasm. General von Blomberg left the hall, his face twitching. It was scarcely conceivable that the French would not move.

The gamble came off however. Flandin, the French Prime Minister, and many of his ministers wanted the French Army to march. But they were half-hearted, and a general election, which was to bring the Popular Front to power, was only six weeks away. The Deputies thought of their electors. General Gamelin insisted that before marching there must be a general mobilization order—in other words the nation must be told it was at war. Flandin went to London. The British Prime Minister, Stanley Baldwin, told him that Britain was against fighting but would, of course, follow France if she felt she had to take action. Many prominent British politicians felt, as Lord Lothian said, that Germany was only going into her own back garden: after all Versailles and the Locarno Treaty were a long way away, and there was no proof that Hitler did not mean

what he said about peace. On 8 March *The Times* considered Hitler's speech in a favourable light and headed its editorial "A Chance to Rebuild".

Instead of sending some divisions into the Rhineland and dragging the British after them, the French did nothing but protest. Hitler said later: "The 48-hours after the march into the Rhineland were the most nerve-racking in my life. If the French had marched into the Rhineland, we would have had to withdraw with our tails between our legs for the military resources at our disposal would have been wholly inadequate for even a moderate resistance."

The occupation of the Rhineland could have resulted in a check for Hitler and perhaps his disappearance for ever from the political scene. As it was, the success of this venture meant that henceforward no soldier or diplomat dared to question Hitler's intuition. The occupation and rapid fortification of the Rhineland ensured that German troops would be a hundred miles nearer Paris at the beginning of a war. It was a direct menace to the safety of Holland and Belgium—and indeed shortly after the Rhineland occupation, Belgium adopted a principle of neutrality instead of alliance with France.

The fortifications of the Rhineland meant that France could not, if she could, come quickly to the aid of her allies, Poland and Czechoslovakia, in Eastern Europe, if Germany attacked them. Without the Rhineland there would have been no thought of Hitler's annexation of Austria nor his rape of Czechoslovakia, nor perhaps the Polish campaign of 1939. It was the absolutely necessary but extremely dangerous first step to his gigantic and terrifying bid for world power.

The tragedy is that a riposte by French and British forces, who would have been supported by the Poles, had absolutely no military risk. It would have been a large-scale police operation. That is, basically, why Churchill once said: "The 1940 war was a totally unnecessary war." The events of 7 March, 1936, were a crucial moment in world history if ever there was one.

## *The Battle of Britain*

### *Hitler Never Again the Master of Events*

DURING THE Thirties, Hitler's Germany, by trickery and by force without war, had recovered the Rhineland, the eastern Baltic cities, had effected the union with Austria, expressly forbidden by the Treaty of Versailles in 1919, and had absorbed Czechoslovakia.

In the first stages of the Second World War, Hitler was to win yet more astounding triumphs. After the rapid conquest of Poland, Hitler offered France and Britain peace. Then, early in the spring of 1940, he occupied Denmark and Norway, defeating an ill-co-ordinated and insufficient Allied effort to prevent him doing so. Only the British Navy came relatively well out of the defeat in Scandinavia. On 10 May, Hitler began his *Blitzkrieg* in the West, invading Holland, Belgium and France simultaneously. By 10 June, when the second phase of the Battle of France ended with German columns crossing the Seine, the French armies were broken; and on 17 June a new French government, headed by Marshal Pétain, sued for an armistice.

The gigantic Battle of France saw both sides fairly equally matched as regards numbers, with the French possessing as many tanks as the Germans and with a far better trained Army as regards what was considered conventional warfare on the pattern of that of 1914-1918. The battle was really won by the German understanding of the powers of the armoured offensive and the paralysis of the French command to react to it. Some 150,000 young men who made up the seven Panzer divisions which broke the Allied armies in two, starting that attack in a sector, the steeply wooded Ardennes Hills where the French High Command believed no serious attack could be mounted, were the real victors. The massed armoured formations supported by dive-bombers and a large air-force had proved invincible. The only bright spot in this terrible defeat had been the evacuation of 350,000 men from Dunkirk, but they were brought back without their arms. The lesson of the Battle of France was that Germany had developed a new and masterly technique for land and air warfare.



## THE BATTLE OF BRITAIN

Britain on 17 June was, therefore, alone in the fight, with small groups of exiles, Poles, Czechs, Norwegians, Dutch and Belgians and what was literally a token French force under General de Gaulle. It was clear that if Hitler could land even half of the thirty-nine divisions massed on the coasts of Western Europe from Hamburg to Cherbourg, Britain would be knocked out for all the fact that her relatively unequipped Army and her Home Guard would put up a desperate and bloody fight. "Britain will have her neck wrung like a chicken," was the comment of General Weygand, the Commander-in-Chief of the French armies from the end of that disastrous month of May.

Hitler hoped and thought that Britain would accept the peace terms he now offered. They included the retention by Britain of all her colonies except those taken from Germany in 1919. The peace offer was refused off-hand. On 17 July, from the Führer's headquarters, Directive No. 16 was issued:

"In spite of the hopelessness of her military position, England has so far shown herself unwilling to come to any compromise. I have therefore decided to begin to prepare for and if necessary to carry out an invasion of England. This operation is dictated by the necessity of eliminating Great Britain as a base from which the war against Germany can be fought and, if necessary, the island will be occupied. The preparations for a large scale invasion must be concluded by the middle of August."

Detailed plans were already drawn up for the subjugation of the island during and after the invasion. They included the deportation from Britain of all males between the ages of 17 and 45. Huge fleets of barges were assembled in all the Dutch, Belgian and French ports. There was to be a feint invasion in the north; but once the conditions for "Operation Sea Lion" were fulfilled, a direct massive thrust against London was to be made from landings in Essex, Kent and Sussex, with slightly later landings in Dorset and Hampshire.

The conditions were two, both depending on the Luftwaffe. One was the disabling of British naval forces in the southern ports, which would enable, at the right moment, the German fleet of barges to cross the channel in lanes between minefields; the second, on which the carrying out of the first depended, was the smashing of the fighter squadrons of the Royal Air Force. It was essential for the Germans to have mastery of the air by day. To that end the British airfields were to be put out of action at any cost.

The Battle of Britain began around 6 August. It was to last, as it turned out, until 7 September. Like the Battle of France, which

lasted over a month and ranged over so much territory, the Battle of Britain was essentially one single battle though it included changes in strategy and direction. Starting on 10 July, the Luftwaffe began its preliminary operation of heavy attacks on sea-ports and its attempts to destroy airfields, acting in fact according to the strategy required by the German Navy which was responsible for the carrying of the invasion force across the Channel.

Luftwaffe losses were surprisingly high and the damage which those raids had done appeared, to the German Air Command, inconsiderable. Goering, who stood next to Hitler in the Nazi hierarchy and was almost a law unto himself, had never, in his heart of hearts, believed in Operation Sea Lion. He firmly believed in absolute air warfare—that by massive attacks on London and southern England he could destroy the RAF and at the same time paralyse the heart of Britain's war effort and cow the people and government into submission. He could, he thought, fulfil the necessary objective for invasion of air mastery by day, and probably end the war before the invasion barges had to move.

In early August began the decisive stage of the battle. The Luftwaffe had now collected 2,665 operational aircraft of which over 1,200 were fighter planes. On 15 August a German bomber force of 100 planes were sent against Tyneside, whilst 800 fighters swarmed over southern England to pin down the British fighters. Fortunately that kind of diversion had been foreseen and seven Hurricane and Spitfire squadrons were resting in the north. These planes shot down 30 German bombers for the loss of two pilots and a few more planes; the experiment of a daylight bomber raid without fighter protection was never tried again. In the south that day 22 British squadrons went into the air, some three times over, and this hard-fought battle inflicted greater losses than the British suffered—though only just. It was the largest air battle yet fought in the war.

The British air strength in fighters was still much smaller than that of the Germans, although by now the output of new and repaired planes was streaming into the British central reserve, thanks to the tremendous ability of Lord Beaverbrook to cut through bottle-necks in production and to the zeal and determination of the aircraft industry's workers and executives. Nonetheless, British strength in numbers was to remain perilously small throughout the battle.

During the next phase, the German air effort was devoted to large-scale bombing of British cities by daylight and by night, and thus the Luftwaffe with its huge numbers of bombers and fighters

was able to carry on for a long time. Indeed from 7 September, when Goering publicly assumed command of the battle, an average of 200 bombers was to attack London every night until 7 November.

The emphasis was definitely away from the bombardment of British sea-ports and airfields and on to that of London. The port of London was partially wrecked. It was not London's condition—London could take it and London had to take a great deal more still—that worried the British leaders. It was the situation of the RAF which was becoming increasingly critical, in spite of reinforcements. Squadrons in the constant daylight battles were becoming depleted and airfields put out of action. Goering might still obtain daylight mastery of the air; and, though mid-September had been now reached and the favourable time for invasion was liable to end with the end of September, there was still time for Operation Sea Lion.

On Sunday morning, 15 September, a hot summer day, an elderly man smoking a large cigar with his wife beside him, sat in what was like the dress-circle of a small underground theatre in Uxbridge, Middlesex. The whole stage was an immense black-board divided into six columns, each containing a large number of light-bulbs. In what was the stalls were several long tables covered with maps and telephones, around which were grouped a number of highly trained men and women. On the left side of the stage was a glass box in which four or five officers were sitting, and on the right another glass box. In this last box the officers wore khaki; they were there to report the activity of London's anti-aircraft guns. All the others in the theatre were wearing Air Force blue. For this was the underground Headquarters of No. 11 Fighter Group which commanded the air defence forces of Hampshire, Sussex, Essex and Kent, the southern approaches to London. It was commanded by Air Vice-Marshal Park.

The old man in the dress circle was Mr Winston Churchill who had driven over that morning from the Prime Minister's residence at Chequers. "I don't know whether anything will happen to-day. For the moment all is quiet," said Park when his illustrious visitor arrived unexpectedly.

Very soon reports came in of the attackers. "Forty Plus from Dieppe." Then another attack with Sixty Plus, and then another with Fifty Plus. On the flat tables the raid plotters were busy, in an uncanny low hum of activity. Orders were given in undertones, telephone conversations were in the quietest of voices. From the box on the left, the Observer Corps, there was a constant stream of

messages. The bulbs on the black-board began to glow; first as various squadrons were ordered to stand by, then other bulbs "at readiness", and finally red lights showing squadrons engaged. It did not take long before every squadron was in the air.

Half an hour passed, then nearly an hour. Our planes had to descend for rearming after a five-minute burst of firing; all had to refuel after seventy or eighty minutes. What would happen if the enemy put in another Sixty Plus? Air Vice-Marshal Park, walking silently among the raid plotters, telephoned Number 12 Group for three squadrons. These were needed for the defence of London and yet it would be fatal to allow the Luftwaffe freedom to attack our planes on the ground. There were five critical minutes when over half the squadrons were on the ground. Churchill, in a low voice like everyone else, leant over and asked Air Vice-Marshal Park: "What other reserves have we?" "None," was the answer.

Then suddenly the movements of the discs on the plotting tables showed an eastward movement of the German planes. They too needed to refuel. Goering did not dare to send in more reinforcements. The raid was over.

Mr Churchill climbed the stairs and reached the open bright day as the All Clear was sounding. It was the end of the biggest daylight raid on Britain and the most critical. It was the decisive incident in the decisive phase of the Battle of Britain and Churchill was right in his Memoirs when, with retrospective judgment, he likened it to Waterloo, which also took place, as he noted, on a Sunday.

Churchill drove back through the quiet Buckinghamshire roads to Chequers. He went to bed for four hours—one of the secrets of his astonishing ability to conserve his energy—and, when he rang for his principal Private Secretary at eight, he noted in his Memoirs that all the news given him was "repellent"—heavy sinkings in the Atlantic, unsatisfactory replies from so and so—but all this was washed out by the news of the air battle: 183 German losses for a British loss of under 40. It did not matter that post-war information showed that this estimated loss was quite wrong, that in fact the Germans had only lost 56 planes; for on 17 September, Hitler gave the order to postpone Operation Sea Lion indefinitely.

Goering had failed to obtain daylight mastery of the air. The invasion threat was to come up again in the spring of 1941 but it was never so serious. The RAF triumphantly ruled the daylight sky over Britain.

The Blitz on London was to continue for a long while, the climax being the moonlight raid on 29 December, concentrated on

the City, when nearly fifteen hundred fires were started. So great was the damage that in retrospect it looks as though Goering could have had a better chance of success had he started his attacks on London earlier. (It is interesting to note that his German naval critics thought that he had started too early.) The devastating raids on Coventry and Birmingham and many other cities were still to come. But Britain was able to wage war. She was able to attack in Libya and come to the rescue of Greece, to remain, in the months of the winter of 1940-41, a single light of hope in the darkness for those groaning under Hitler's sway in Europe.

After Hitler's failure to smash the Soviet Union in the first campaign of 1941, his defeat seemed probable and, after the entry of the United States into the war, certain. Had Hitler knocked out the British homeland in the Battle of Britain, even though a British government in exile had remained in Canada, Europe would without question have been his. He might not have been the master of the world. But he could have decided whether, how and when to attack the Soviet Union and the U.S.

After the Battle of Britain Hitler was never again to be master of events. Britain had saved Europe from Napoleon by saving herself from invasion in 1805. She did it again in 1940 and saved Europe, and possibly the world, from a domination more ruthless, efficient and horrible than anything conceivable in the civilized eighteenth and nineteenth centuries.

## *The Attack on Pearl Harbour*

*The United States Enters the Second World War, and Victory Becomes Inevitable*

THE NEWS of the Japanese attack on the American naval base of Pearl Harbour first reached Britain in the shape of an insignificant news item to the effect that Japanese aircraft had attacked some American shipping, which was heard at the end of the nine o'clock news on the evening of Sunday, 7 December, 1941.

Mr Winston Churchill, listening at Chequers and alone with two American diplomats, did not, straight-away, think it significant. He was preoccupied with the news from Libya and from the Russian Front. However, it only took a few minutes' conversation after the news for Mr Churchill, from his ever-open office in Chequers, to be speaking to President Roosevelt. "Mr President," he asked, "what's this about Japan?" "It's quite true," said Roosevelt, "they have attacked us at Pearl Harbour. We are all in the same boat now." Not even President Roosevelt at that moment knew the immense damage which had been caused by the Japanese attack, but to Churchill the news was one of the most exhilarating moments of his life. At last America was in the war, at last the ultimate issue of the war was no longer in doubt. "Being saturated and satiated with emotion and sensation, I went to bed and slept the sleep of the saved and thankful," wrote Mr Churchill in his war memoirs.

The world picture at the end of 1941 was very much less disastrous than that at the end of 1940. Britain in 1940 was alone in facing the menace of Hitler and on 29 December there had taken place the heaviest and most disastrous air-raid on London since the beginning of the Blitz. At the end of 1941, Britain was still fighting for survival, and in the summer had only just reduced the U-boat sinkings in the Atlantic to a proportion which did not mean starvation for her and the end of the war effort.

In June, 1941, Hitler had invaded the Soviet Union. He had met with more stubborn resistance than he had expected and on the Central Russian Front his army had just been checked in front of Moscow. In North Africa, after many ups and downs, the British

and Commonwealth Army was attacking the Italians and Germans. The issue in North Africa was still uncertain; it was to result, in the long run, in a defeat, but this Churchill did not then expect.

The United States was lending Britain and Russia all aid short of war, and Mr Averell Harriman, one of Roosevelt's inside team, had attended with Britain an Allied Conference at Moscow, discussing aid for Russia. But if the picture was more promising then than in 1940 it was still fraught with uncertainty. The Japanese attack on the United States removed the uncertainty. The might of Britain and the Commonwealth, of Russia and then of the United States would inevitably prove invincible.

Japan had signed the anti-Comintern Pact with Germany and Italy in 1936, and in 1937 had begun her long war aimed at the conquest of China, a war which inevitably made the United States her enemy. But in 1940 Japan for a while seemed to hesitate about the German Alliance. Her government had been annoyed by the Nazi-Soviet Pact in 1939 and had also been impressed first by Britain's survival in the Battle of Britain and then by the sea victories won by the British Fleet in the Mediterranean. The Mikado and most of the Japanese aristocracy and some of the leaders of the Navy were convinced that Japan, with her vulnerable economy, should never run the risk of having to fight Britain and the United States together.

However, the fall of France and the weakness of Britain in the Far East tipped the scales the other way. Here were the vast rich colonial possessions of Britain, Holland and France almost ready for the taking: all through the summer of 1941 there was talk of Hitler's victories over the Soviet Union. now was the historic moment for Japan to finish off Chiang Kai-shek in China and to impose on all the Far East the Japanese New Order—or as it was euphemistically called, "The Co-Prosperity Sphere".

Prudent elements, a government headed by Prince Konoye, were still in charge of Japanese policy; but even the Konoye government was forced to make some move in the direction which the Army leaders desired. Japan demanded bases in Indo-China from Vichy and even before this demand had been granted had sent troops to seize them. The number of Japanese troops in Indo-China had been fixed by a convention in the summer of 1940; but the number was constantly being added to and by July, 1941, Japan had some five divisions stationed there. For this there could only be one apparent reason, the prospective invasion of Malaya and Thailand.

The American and British answer was, in July, economic sanctions and the freezing of Japanese assets. The Japanese Navy was very quickly forced to eat into its reserves of oil. Under popular indignation, a new government headed by Admiral Tojo was appointed by the Mikado and war with the U.S. and Britain became a probability, unless the Axis received some deafening blow.

The British fear, and it was a lively one, was that Japan would attack Malaysia and Singapore or Burma and that no *casus belli* would be given to the United States. Heart and soul behind Britain and lending all aid short of war—American destroyers and cruisers were protecting convoys in the Atlantic against German submarines—Roosevelt still realized that Congress would not declare war unless America was actually attacked. When sanctions were imposed on Japan, the American requirement for withdrawing them was not only that Japan should leave Indo-China, but also China. It was a hard demand. It meant that for Japan the alternative to war was to seek a full understanding with the US—which would entail denouncing the Alliance with Italy and Germany and all conquests in Asia from America's allies.

In December, 1941, negotiations between Japan and the United States continued, each side making demands the other was bound to reject. Yet war is never inevitable until it happens. In November, Admiral Tojo appointed Mr Saburo Kurusu, who was known to be anti-Axis, as a special envoy to Washington to obviate the serious situation between the two countries. This to some extent offset, in the eyes of the Americans, the huge military expenditure voted by the Japanese Diet in November, 1941, and its resolution ascribing the dangers of war as being due to "American intentions to create a world hegemony".

Mr Kurusu, indeed, continued his peace negotiations right up to the moment the Japanese struck; and they struck, without a declaration of war, at the American Fleet, as indeed they had done at the Russian Fleet in 1904 before the Russo-Japanese war. The American government had not been fooled by Japanese diplomacy even though all hope had not been given up, and on 5 December President Roosevelt had sent a long personal letter to the Mikado warning him of the folly of going to war. But the government and the American Navy were caught off their guard completely by the Pearl Harbour attack.

Total American naval strength was of course vastly superior to that of Japan, and even the American naval concentration in the Pacific was very nearly the equal of the Japanese Navy. The attack



## THE ATTACK ON PEARL HARBOUR

on the Pacific Fleet's naval base on Oahu, which is one of the Hawaiian group of islands, was planned in October. It was designed at one blow to give Japan unquestioned naval superiority in the Pacific so that the conquest of Malaya, the Dutch East Indies and the Philippines could be carried out successfully. On 6 November, a number of battleships and cruisers protecting a force of aircraft-carriers sailed from the Kurile Islands north of Japan, where it had been secretly concentrated, to some 275 miles north of Hawaii. Admiral Nagumo, who commanded this force, arrived at his striking point on 6 December without being observed at all.

Meanwhile, Japanese consular officials and agents in Hawaii had been sending Tokyo a constant stream of information so that, when the Japanese aircraft attacked, each pilot knew the exact location of each ship he was aiming at destroying. Ninety-two ships lay at anchor in Pearl Harbour, of which by far the most important targets were eight large battleships, the nucleus of the American Pacific Fleet.

It seems that fate was on the side of the Japanese. At 6.30 a.m. on 7 December a small Japanese submarine entered a prohibited area off Oahu and was sunk by destroyer and aircraft. The naval watch-officer was informed and, in his turn, informed the Chiefs-of-Staff at Pearl Harbour; but for some reason no general alert was given. More extraordinary still it is a fact that at 7.00 a.m. the operator of a provisional detector station out in the Pacific belonging to the American Army reported a large flight of aeroplanes about 130 miles from Oahu to the east-north-east. An army lieutenant decided that the aeroplanes must obviously be friendly ones and took no action. An unusually cloudy sky added to Japanese luck. A routine dawn patrol of American aircraft had passed over Oahu and reported nothing.

At 7.50 a.m. on that Sunday morning a great noise of approaching aircraft was heard on Oahu and at 7.55 the first bombs fell. Low-level bombers and torpedo aircraft attacked the ships in the harbour and the naval installations; high-level bombers bombed the airfields and also Honolulu some seven miles away. The attacks were followed by fighter planes firing machine-guns with incendiary bullets, particularly at the planes on the airfield; some pocket submarines attacked the harbour at the same time.

Just as there had been no adequate air or sea patrols, so inside Pearl Harbour no precautions against attack had been taken; war-ships were moored close one against the other and a large proportion of officers and ratings were on leave and many sleeping ashore. A

similar peace-time carelessness pervaded the Hickham army-airfield close to Pearl Harbour and other aerodromes on the island. Before the last attack, which was made at 9.00 a.m. and which met with heavy anti-aircraft and naval gun-fire, the Japanese were able to strafe their objectives almost without resistance and aircraft were able to return to their carriers to refuel and to return to the attack.

Of the eight battleships, the *Arizona*, *California* and *Utah*, a target ship, were sunk outright; the *Oklahoma* capsized shortly after being bombed; the *Nevada* was set on fire and put out of action for many months; the three others were more or less seriously damaged. Considerable additional damage was done to ships, a mine-layer was sunk, three cruisers damaged, two destroyers sunk and another damaged. Some 2,300 officers and men were killed and some hundreds of the nearly two thousand wounded died later. The Japanese are said to have lost 60 aircraft, whilst the Americans had 173 destroyed and over 100 damaged.

The United States Government set up a board of inquiry after the Pearl Harbour disaster and the report which was published very quickly found Rear-Admiral Husband Kimmel, Commander-in-Chief of the Pacific Fleet, and Lieutenant-General Walter Short, commanding the Department of Hawaii, guilty of dereliction of duty. It became clear from the inquiry that both these senior officers had been warned of the danger of attack; if they had obeyed the warnings, the aircraft warning-system of the Army should have been working and the distance reconnaissance of the Navy in action. Most fortunately for the American Navy, some aircraft-carriers, among them the brand-new *Lexington*, were away from Pearl Harbour on manoeuvres.

If Pearl Harbour and the consequent entry of the US into the war made Allied victory inevitable, it began a period of staggering reverses for the Allied armies. Never did a nation exploit its advantages more rapidly than did Japan. The maiming of the American Fleet enabled the Japanese to invade the Philippines after an air attack on 8 December which destroyed half the American and Philippino air-force on the ground. Thailand was invaded on 7 December, and very shortly afterwards the Japanese invasion of Malaya began.

On 10 December, off the east coast of Malaya, occurred the greatest British naval disaster of the war. During the autumn of 1941, Churchill had sent out two of Britain's latest battleships, the *Repulse* and the *Prince of Wales*, more powerful than any ships of the Japanese Navy, to protect Malaya and to deter Japan from

## THE ATTACK ON PEARL HARBOUR

sea-borne invasions. They were both sunk by Japanese torpedo bombers based on Saigon in Indo-China. Well might Churchill remark that the Japanese were far better versed in air-warfare than they had been given credit for.

Hong Kong fell into Japanese hands on 25 December. Nothing could stop the jungle-trained troops of Japan in Malaya, and Singapore surrendered on 15 February. By the end of February Japan, after wiping out the Dutch and British fleet in the Battle of the Java Sea, was in possession of the Dutch East Indies. The Philippines were finally won in May; and by the end of that month the Japanese had conquered Burma, were across the Indian frontier and had reached the Burma Road by which American and British supplies reached Chiang Kai-shek in China. By the end of May the Japanese troops in New Guinea were only 400 miles from the Australian continent.

Yet the Japanese totally misjudged the speed with which the United States Navy and Air Force could once again become effective in the Pacific. The American Pacific Fleet was quickly reinforced and not, as Churchill had feared might be the case, too greatly at the expense of the Atlantic where the battle against the U-boats was still at a critical stage. By April and May, 1942, American warships and carriers were carrying out heavy raids on Japanese bases and Tokyo was heavily bombed by sea-borne aircraft. After the hard battles of Coral Island and Midway Island (4 June) naval initiative in the Pacific passed once and for all from the Japanese to the Americans.

Hitler and Mussolini declared war on the United States on 11 December. Hitler had tried hard to persuade the Japanese to attack Russia and the British possessions in the Far East and not to embroil America in the war. When he and von Ribbentrop, his Foreign Minister, first heard the news of Pearl Harbour they refused to believe it. His better judgment had been against bringing in the US, but this first Japanese success made him change his mind. Ciano describes Mussolini as being very happy about America's entry as, in his phrase, "it clarified the issues".

What Mussolini thought was of no great moment, but it is astonishing that Hitler did not appreciate more fully the importance of America's overwhelming industrial power in a long war. He was the victim of his own prejudices and theories and in one of his many monologues to his staff at his Headquarters he is reported as saying, in January, 1942, "I don't see much future for the Americans. It's a decadent country. And they have their racial

#### THE ATTACK ON PEARL HARBOUR

problems. My feelings about them are feelings of hatred and deep repugnance. Everything about the behaviour of American society shows that it is half-Judaized and half-Negrified. How can one expect a State like that to hold together?"

Fate blinds those bent on self-destruction, and so, strange as it may seem, the attack on Pearl Harbour comforted Hitler as well as Churchill.

## *The Battle of Stalingrad*

*The Tide of the Second World War Turns Decisively in Favour of the Allies*

ON 22 June, 1941, on the very day that, in 1812, Napoleon had started his invasion of Russia, the German armies crossed the Soviet frontier. Having over-run Poland in 1939, occupied Scandinavia, crushed France and, early in 1941, successfully invaded Yugoslavia and Greece, Hitler had enlarged the war on a grand scale. His only setback had been that Britain had rejected his peace offer after the fall of France in 1940, defeated his Air Force and put an end, for the moment, to any possibility of invading the last country holding out against the Axis.

The invasion of Russia—Operation Barbarossa—had been prepared and undertaken against the advice of many German generals. The German military mind was set against a war on two fronts; but Hitler did not consider that Britain constituted a second front by 1941, in spite of her vigorous activity in North Africa and the increasing help she was receiving from the United States.

The determination to conquer Russia and to annex most of the territory between the Vistula and the Urals was a fundamental part of Hitler's policy. The German master-race must conquer territory in the East, territory held by inferior Slav races whose destiny was to return to slavery and who were to be permitted to live only in so far as they helped the German cause.

From the beginning, all Russians were treated much as the Jews had been; as a people to be used for labour purposes until they dropped and, if unfit for work, to be exterminated or allowed to starve. All the Nazi leaders spoke the same language about Russia as did Himmler when he said: "Whether the Slavs live in prosperity or starve to death like cattle interests me only in so far as we need them as slaves to our Kultur; otherwise it is of no interest to me. Whether ten thousand Russian females fall down from exhaustion while digging an anti-tank ditch interests me only so far as the anti-tank ditch for Germany is finished." Such an attitude, which included the shooting of all Russian commissars (who were in

fact part of the Soviet Army) was as some of Hitler's advisers dared to suggest, one which lost Hitler any allies he might have found among Russians and particularly the Ukrainians, who hated the Stalin régime.

Stalin knew that the Nazi-Soviet Pact of 1939 meant for Hitler nothing but a postponement of his world plans. But Stalin believed that the Pact gave Russia an opportunity of strengthening herself for the inevitable struggle—and this indeed it did. But he also thought that Hitler might well wear himself out in the struggle against Britain which would involve, in the long run, the United States. In 1941 Stalin took the view of many German generals that Hitler would be unwise to attack Russia so long as Britain had not been conquered.

In spite of information from many sources that Germany was concentrating more and more troops on Russia's frontiers; in spite of an explicit warning from Churchill in May, Stalin continued to believe that his hour was not yet. A new Trade Treaty had been signed as late as January, 1941. Russia continued to keep up supplies for Germany of war materials and food until the invasion actually began; Germany continued to do the same. Stalin's troops on the frontier were deliberately not kept on a war-footing, and so Russian units on the frontier were taken by complete surprise when, at 3.30 a.m. on 22 June, the German attack began, on a front of 1,500 miles, running from Petsamo in the Arctic to the Black Sea.

Hitler's first successes were overwhelming. Profiting from surprise and immense air superiority, German armoured divisions pushed forward with apparent recklessness, driving deep wedges into the Russian front. The advance of the German armour prevented the orderly retreat of the Russian infantry before the main body of the Wehrmacht. By mid-August, the northern German army of Von Leeb had cut off hundreds of thousands of Russians on the Baltic coast and was approaching Leningrad; in the centre, the Germans were at Smolensk, an advance of five hundred miles; in the south, Von Runstedt had driven down the Dnieper valley where the great Dneprostroy Dam was situated and had reached the Black Sea. At the end of July the Wehrmacht generals began to think that Hitler was right after all, and Halder, the most opposed to the Russian campaign, wrote on 3 July after the first staggering successes: "It looks as though the campaign against Russia has been won in a fortnight."

But by mid-August the experienced German generals were already changing their minds. German intelligence had identified

## THE BATTLE OF STALINGRAD

three hundred and sixty Russian divisions, still more or less intact, whereas two hundred only had been counted on. Everywhere the Russians were resisting furiously and on all fronts there were counter-attacks which, if failing to stop the German advance, were disquieting; as the German armies advanced in the south and south-east towards the Crimea and the Caucasus and further north and north-west towards Leningrad, the front grew ever wider and Russian numerical superiority became more important.

Most important of all, the German generals held that, on account of German numerical inferiority, in a long war, or at any rate one which might be longer than Hitler expected, it was essential to take Moscow before the winter set in. This and this alone might lead Stalin to throw in the sponge.

Hitler, on the other hand, was wedded to the capture of Leningrad in the north and of Stalingrad in the south, with the consequent mastery of Russia's oil regions and the Caucasus. If these two cities fell, his intuition told him that Russia would collapse. He deliberately weakened the German central army group and large Russian forces were able to concentrate between Smolensk and Moscow. At Kiev, in September, the Germans captured six hundred thousand prisoners in what Hitler claimed was the greatest battle in world history. But to Halder this victory was a blunder for it had been won at the expense of a dash on Moscow. It was not until 2 October, and all meteorologists predicted an early winter, that Von Brauchitsch was able to begin his head-on attack on Moscow. On 3 October, Hitler stated on the German Radio:

"I declare today, and I declare it without any reservations, that the enemy in the East has been struck down and will never rise again."

By the end of October rain fell in torrents and the German tanks were bogged down; but the Germans were only forty miles from Moscow. By the beginning of November snow fell quickly; by mid-November it froze and the attack was resumed. By 2 December the advance guards of the German Fourth Army were in the suburbs of Moscow and in sight of the Kremlin. The Russian government had left Moscow, but Stalin remained behind. On 4 December he reviewed new bodies of élite troops held in reserve for a last-ditch defence, and on 5 December the Russians counter-attacked the Germans in the suburbs, causing the whole German Fourth Army to withdraw some miles.

The Germans had failed to take Moscow. If the Japanese had been able to know the minds of the German generals they might have

hesitated once more and cancelled the attack on Pearl Harbour on 7 December. But the situation in Russia was difficult to understand, so great had the German successes been.

Hitler refused Von Brauchitsch's request to allow the central army group to withdraw and take up a winter defence line; he took over himself the supreme command of the German armies in Russia. This was a fatal step for Germany; it did not appear so at first, for, although the German central army suffered heavy losses all the winter and great torture from the cold, it remained close to Moscow. In the spring of 1941, after a Russian offensive on all fronts had been kept within bounds, Moscow was still directly menaced and Leningrad still besieged. Sixty million Russians were now living and dying in territory held by the Germans.

In the spring Hitler's "intuitive" conduct of the war still seemed likely to lead to victory. He made up his losses by huge drafts from Germany and by many new divisions from Rumania, Hungary and even from Italy. When he renewed his offensive in the early summer he no longer made the mistake of failing to concentrate on one objective. The great drive was to the south. Sebastopol in the Crimea fell. On 21 August the swastika flew on the highest mountain in the Caucasus, Mount Elbruz, and German troops had captured the great oil centres at Maikop. They had reached a point barely twenty-five miles from Grozny, the centre of the Caucasian oil-fields, and only a hundred miles from the Caspian Sea. Hitler might be able to advance further to Batoum, the great oil port, and to threaten the Middle East. But first he needed to take the great city of Stalingrad and from there to strike north along the Volga, roll up the Russian forces on the central front and take Moscow.

On 23 August the German armies were just north of Stalingrad; on the 27th they were fighting in the suburbs and the great and decisive battle began. Its first phase was to last until mid-November and, in Stalingrad itself, Russian and German infantry began to fight among the rubble a terrible three-months' battle. On 8 November, Hitler declared Stalingrad to be in his hands and he declared on the radio that the end of the war with Russia was in sight. But this battle in Stalingrad was not to end in November: a few days after Hitler's boastful outburst, the battle was to wear a very different look.

On 11 November, Hitler was at Berchtesgaden, his beautiful retreat high up in the Bavarian Alps, with Keitel, Jodl and his personal staff, still basking in the happy belief that Stalingrad was



now captured and the great pincer movement north about to take place and the Russian central front to be destroyed. That afternoon the Führer's peace of mind was destroyed by an alarming piece of news. A powerful Russian force had appeared and broken clean through the Rumanian Third Army which was protecting the north side of the great salient which the German attack on Stalingrad had made. It was followed by reports of strong Russian attacks, using thousands of tanks, on another Rumanian army which was defending the southern line of the salient.

The German Chief-of-Staff, Zeitzler, told Hitler that he should make an immediate withdrawal of the German Sixth Army, commanded by Von Paulus, which was fighting in Stalingrad. Hitler shouted down the telephone: "Never, never, never will I leave the Volga." By 22 November, when Hitler was back in his war H.Q. in East Prussia, the Russian armies from the north and south had joined and surrounded Von Paulus and his two hundred thousand men.

Hitler recalled his most brilliant general Von Manstein from the northern front and put him in charge of a relief operation. He was to advance from the Don and break the blockade of the German Sixth Army. Von Manstein told the Führer straight away that this operation could only succeed if Von Paulus was authorized to retreat towards the relieving German army and to abandon the attack on Stalingrad. Hitler refused. When the German relief force advanced, the full fury of Russian winter came into play, temperatures dropped to zero, snow piled up in huge drifts.

On 9 December the advance German units were within thirty miles of Von Paulus and the besieged troops could see the flares of their rescuers. Once more Zeitzler begged Hitler to sanction a partial withdrawal of the Sixth Army from Stalingrad and once again Hitler refused. Von Manstein's forces were obliged to withdraw. By now Von Manstein needed every division he could scrape together to enable the German armies in the Caucasus to escape across the Don from their rash advance. An Italian division formed part of this once proud spearhead. Ciano, at Rastenburg, asked if the Italian losses had been heavy: A German staff officer answered: "No losses at all, they are running."

On 8 January the Russians offered Von Paulus an honourable surrender. Von Paulus asked for leave to accept: it was contemptuously refused. Five thousand Russian guns opened fire on the besieged German army, now solely fed and supplied with arms by an air-lift which Goering had promised would be effective, but

which failed lamentably. On 24 January the last airstrip held by the Germans in front of Stalingrad was lost: once more Hitler forbade surrender.

On 30 January, when Von Paulus told Hitler that final collapse was a matter of hours, the Führer made Von Paulus a Field Marshal, remarking cynically: "There is no record in military history of a German Field Marshal being made a prisoner." The starving, frost-bitten German soldiers were not cheered when they listened to Marshal Goering's speech saying on 31 January: "A thousand years hence Germans will speak of this battle of Stalingrad with reverence and awe and will remember that in spite of everything Germany's ultimate victory was decided there."

Von Paulus surrendered, sitting dejected on a camp-bed in his bunker when Russians armed with tommy-guns crowded the entrance. Flying over the blood-spattered wreckage of the battlefield, a German reconnaissance plane radioed back: "No sign of the fighting at Stalingrad." It was not at all an heroic end, for misery had destroyed any possibility of heroism. By July Von Paulus and General Seydlitz had become leaders of a Free-German committee in Moscow and were calling on the German Army to eliminate Hitler.

In 1941, when Hitler invaded Russia, a wave of hope had swept through Britain and the conquered countries of Europe. The first German successes somewhat dimmed this hope; but it still remained. In December, 1941, when the United States came into the war after the attack on Pearl Harbour, ultimate victory for the Allies appeared certain. But many grave disasters fell on the Allied cause in the Far East and in North Africa.

In 1942, when Hitler's summer offensive in Russia looked ominous, a large British and Commonwealth Army was defeated in the Libyan desert by Rommel after a long war in which fortune had turned from one side to the other. The Germans re-took the important port of Tobruk, captured by the British in 1940, and drove General Auchinleck's army back to the last defensive position, at El Alamein, before the Delta. Rommel and his Italian allies saw Alexandria and Cairo in their grasp; if the Germans could pour down from the Caucasus, the Middle East would be in Axis hands and victory certain.

During the autumn the British slowly reasserted their naval control over the Mediterranean, temporarily lost early in 1942, thus damaging vital supplies to Rommel's army. At the same time reinforcements of men and tanks for the British poured into Egypt

# *The Emergence of Chinese Communism*

## *China Becomes a Modern World Power*

NOTHING DEFINITE is known of the origins of the Chinese. In the oldest authentic records they already appear as a more or less civilized agricultural people settled in the valley of the Yellow River and surrounded by savage tribes.

The authentic history of China begins with the inauguration of the Chou Dynasty in 1122 B.C. At this time the boundaries of the kingdom extended to the sea, and the principles of Chinese civilization, which continued to function until the advent of the present century, already existed. The feudal system, which had previously obtained to some extent, was now greatly extended by the creation of five orders of nobility, among whom the whole country was divided, except for a domain reserved for the king.

The land was cut up into allotments, a central square being cultivated in common, and its produce made over to the government. In the urban districts an income tax was in force. The furnishing of soldiers and military equipment by the peasantry was also a feature of the system; each state maintained a standing army which proved a fruitful source of war and disorder.

It was to the second ruler of the Dynasty, the Duke of Chou, a younger brother of the founder Wu Wang, and outstanding as a general, statesman and philosopher, that the reorganization and resettlement of the Empire was mainly due. Other states, only partially Chinese, were ultimately absorbed by Chou.

In the midst of this turbulence Confucius was born in Lu, one of the smaller states, now part of Shantung. A philosopher of great stature and the founder of Confucianism, which was to become one of the great ethical forces of the Orient, Confucius embarked upon a political career and rose to high office, but his principles were too strict to find favour with a dissolute prince and he was forced to retire. After many years spent in exile, he was allowed to return to Lu, where his teaching attracted a number of disciples.

In 221 B.C., after the last remnant of Chou rule had disappeared, the Prince of Ch'in was able to declare himself the first Emperor

of China. The country was now divided into thirty-six provinces, administered by officials directly responsible to the Emperor. This form of government existed to the twentieth century.

Under Ch'in internal peace was gradually established, and China was able to turn her attention to the Huns who were threatening her northern borders. To keep them at bay Ch'in linked up into a continuous barrier a number of defensive walls which had been erected from time to time by the border states. This Great Wall served its purpose well, and the Huns never succeeded in over-running any significant part of Chinese territory.

Before the end of Ch'in's reign the empire had almost reached its limits. Despite his outstanding achievements, Ch'in has been regarded always with a particular detestation by the Chinese on account of his cruelty. After his death in 210 B.C. everything seemed about to lapse once more into chaos, but after a decisive battle fought in 202, Liu Pang became the first Emperor of the Han Dynasty, which was to last for four hundred years. At roughly the central point of this Dynasty the Chinese successfully invaded Central Asia and conquered Korea. By A.D. 22 Turkistan had been annexed, and it was only by an accident that direct political communication with the Roman Empire was not established. But trade, particularly in silk, was carried on through Parthia, and in A.D. 166 Roman merchants reached China by sea.

During the last century of the Han Dynasty, a rebellion broke out due to misgovernment. This resulted in the empire being dismembered and each great chief fighting for his own land. In 280, however, the whole of China was once more united, though only for a short time. In the north and north-western provinces there were large barbarian settlements, which now took advantage of the prevailing Chinese exhaustion to shake off their yoke. Some Tartar chieftains began by setting up a kingdom in Shansi, and finally succeeded in subduing the whole of northern China, which afterwards split up into a number of small kingdoms.

Meanwhile four dynasties succeeded one another at Nanking and indulged in intermittent warfare. These were the truly Dark Ages of Chinese history, but during them Buddhism took root all over the country. In 581 the last of these dynasties was overthrown and China was ruled again by one man. The Sui Dynasty was, however, short-lived, for the extravagances of the second emperor proved such a great burden on the country that rebellion broke out on all sides. After many years of fighting, the T'ang Dynasty took over, the Turks were crushed, Tibet opened up and central India

invaded. The Chinese empire again stretched to the Aral Sea, and its civilization penetrated into Indo-China, the Southern Seas and Japan.

In 874 a terrible rebellion broke out which lasted for ten years, and was only crushed with the help of a Turkoman tribe, and the partition of the empire followed shortly after. An era of military despotism now set in. Within little more than fifty years five dynasties arose, one of which was of Turkish origin, while another existed only by the support of the Khitans, who by degrees established themselves as far south as the Yellow River. To the Khitans and another tribe, the Tangut, which had risen to power on the western borders, China had to pay tribute, but in 1120 she made an alliance with another Tartar tribe, the Chins, who succeeded in dislodging the Khitans, only to take their place. Gradually the Chins occupied the whole of northern China.

Genghis Khan began his career of conquest in 1206, but it was left to his son Ogotai to drive out the Chins completely, and Genghis's grandson, Kublai Khan, to subjugate the country south of the Yangtse to the Mongols. Kublai built himself a capital at Peking, and from there governed over a Chinese empire larger than any other of which there are records. After his death, however, a rapid degeneration set in and by 1355 a rebellion in the provinces south of the Yangtse was in full swing, led by a Buddhist monk named Chu Yuan-chang. Chu eventually became the founder of the Ming Dynasty, removed the capital to Nanking and reigned under the title of Hung-wu.

Once more China was in the hands of the Chinese, and the prestige of the Mings was high. War was successfully waged against Mongolia, Korea became a vassal state and Burma was compelled to pay tribute.

Meanwhile a new power had been growing in the southern parts of the region now known as Manchuria, which presently began to make war on the Mings. By 1626 they were firmly established with their capital at Mukden; by 1664 all China had submitted to them. They were to remain in power until 1911.

This very sketchy account of nearly four thousand years of Chinese history can only show that the war-like nature of the Chinese people was responsible for alternating periods of progressive unity with absolute chaos, which prevented the empire, great though it was, from ever being a world power, in the accepted sense of that term. What opportunities were lost can best be hinted at by pointing out that despite all these costly wars, by the accession of the Manchus the finances of the country were never in a better

state, that agriculture had made great progress, and that the population had increased by leaps and bounds.

By the nineteenth century other problems arose with the arrival of British and other traders at Canton. By placing irksome restrictions on trade, the Chinese authorities created dangerous friction, which resulted in the Opium War of 1840-2, which was ostensibly fought by the British to stop the smuggling of the drug. The result was the cession of Hong Kong to the British and the opening of five treaty ports.

A variety of causes led to the outbreak of another war, and this time not only was Canton taken, but British and French troops occupied Peking. At this time the T'aping Rebellion, which had broken out ten years before, was still raging in the Yangtse valley. The rebels were finally overcome in 1864 by the efforts of the Viceroy Tseng, ably assisted by General Gordon at the head of a small foreign contingent. Millions of people perished in this frightful upheaval, and nine provinces were devastated.

Until the 1890s, China had shown few signs of adapting herself to the conditions of modern civilization—in striking contrast with the Japanese—but the disastrous war of 1894 with the Japanese, and aggression by other foreign invaders, seemed to arouse them from their apathy. The Emperor prepared to introduce reforms, but these were nipped in the bud by his aunt, the formidable Empress-dowager. This spelled the doom of the Manchus.

In October, 1911, revolution broke out, and at the end of the following year the first Chinese republic was inaugurated. The first president, Yuan Shih-k'ai, governed with an iron hand, but this was not enough to prevent the country being split into north and south, who engaged one another in war for the supremacy.

From 1920 to 1926 China was torn apart by this conflict, during which the central government steadily lost authority, and a number of war-lords gradually obtained control of one or more provinces. In 1926, however, the process of disintegration was ended by the rise of the Chinese Nationalist Party (Kuomintang), first under Dr Sun Yat-sen, and then under his successor General Chiang Kai-shek. Complete reunification of China was delayed by a split in the Kuomintang, who became alarmed by the growing influence of Soviet advisers. All declared Communists were expelled from the Kuomintang, whereupon they withdrew to Wuhan and established a separate government there.

Chiang organized campaign after campaign against the Communists to destroy them, but led by such men as Mao Tse-tung and

Chu Teh they successfully resisted extinction by vastly superior forces. The Japanese invasion of China in 1935 distracted Chiang from his pursuit of the Communists; indeed, he sought their co-operation in opposition to the common enemy. A kind of co-operation was established in that they agreed to stop fighting one another and concentrate their forces against the invader, maintaining their separate armies and exercising independent control over the areas under their influence.

This breathing space gave the Communists time to gather strength and to organize themselves on a sound basis. As the war progressed, relations between them and the Kuomintang gradually began to deteriorate, and when Japan surrendered to the Allies in 1945, and Chiang once more turned his full attention to overcoming the Communists, he found the balance between his own forces and those of Mao greatly changed. At the end of two years, despite continued American help, Chiang was compelled to leave the mainland of China and withdraw to Formosa. The Communist leaders moved to Peking and there set up the first Communist government, with Mao as ruler of the most populous country in the world.

For the first time for many centuries China was once again under strong central government which from the beginning kept a firm grip on the whole vast territory. The two decades since 1947 have been devoted mostly to internal reorganization, but despite the concentration on this great task, and despite her exclusion from the United Nations, China has already made a contact with the outside world which she never made at any other period of her history.

Currently she is contesting the leadership of the Communist world with Russia, and it is quite clear that she is determined to acquire this leadership. In the meantime she is making her influence felt in practically every area of the world where emergent nations are seeking assistance from their more powerful and richer colleagues. Already her influence in South-west Asia, in Indonesia and in Africa is formidable. Her development of her own nuclear weapon must finally place her in the front rank of the great powers. Even now she can no longer be ignored; then she will have to be admitted to world councils. But the question is, will she then be prepared to co-operate with those who so far have cold-shouldered her; or will she single-handed set out to achieve world hegemony, which is clearly her ultimate goal?

## *The First Flights Into Space*

### *Man Ceases to be Earthbound*

"SPUTNIK I" went into orbit in 1957—the first man-made satellite to join the moon in its journey round the earth. The Soviet Union had constructed it; had assembled the enormously powerful rocket which shot it into space, beyond effective reach of the earth's gravity; and the Soviet Union had given it that pleasant Russian name—meaning "companion" or "fellow-traveller". Within a week it had become a part of every language in the world.

To have launched an object so far into space that gravity was unable to recall it, yet not so far that it travelled on for ever, prisoner of its own momentum, and was lost, was a tremendous feat. "Sputnik" travelled round the earth many times before gravity claimed him and he burst into flames re-entering the atmosphere. He had till then travelled an orbit just far enough out for the centrifugal force dragging him off into space to be balanced by the slight force of gravity at that distance.

But this, though thrilling, was only one step—a first, tentative, step—in the race to conquer space, a race which has no foreseeable end. A "Sputnik" into orbit, a man into orbit, a team of scientists into orbit, to the moon, to Mars, to the outer limits of the Solar System. . . .

Each stage in the race is more exciting, more exacting than the one preceding. When the Russians followed up "Sputnik I" (and other "Sputniks") with a man into orbit, in 1961, the world rejoiced.

To the Soviet scientists listening it was as if contact had suddenly been established with Mars, as if a Martian wavelength had been found. But this new star, which scientists from Vladivostok to Jodrell Bank were soon tracking, was of far greater interest to science, to the man in the street, than a chance conversation with a man from Mars. The man with whom they had established contact was a perfectly normal human being, floating calmly—serenely, it seemed—outside the earth's atmosphere. A man in space.

It was fifteen minutes after the man had begun his journey into



the unknown that the words came back, faint, distorted, but intelligible. "Flight proceeding normally——"

The message came from somewhere over South America, a message from a young man who, a quarter of an hour earlier, had been lying down in eastern Russia, waiting to be flung into orbit, like the "Sputniks" before him, on the nose of a rocket: the first human being—should he be successful—to achieve a visit to the outer regions, beyond reach of gravity, of human aid. Back in the Soviet Union he had just left, it was early morning on 12 April, 1961: here, over the middle of Argentina, it was late evening of the 11th.

An hour and forty-eight minutes after he had been launched into space, Yuri Alekseyevitch Gagarin landed at a pre-arranged spot in the Soviet Union. Moscow time was 10.55 a.m. The first man into space (the first man, at least, to be brought back alive: no one outside the Soviet Union knew whether there had been failures before this final, crowning achievement), the first man was back, in good health, good spirits. He was fine, it had all been exciting—good fun. "One's legs, one's arms—they weigh nothing. Objects float around in the cabin—I didn't just sit in my chair, I hung in space."

Ten months after Gagarin's flight, an American, John Glenn, followed him—on 20 February, 1962. As against Gagarin's single orbit, Glenn achieved three—but in between had come the Russian Titov with seventeen and a half, in August, 1961. Historically, the American flight was of great importance: the United States, a slow starter, reluctant at first to devote the huge sums necessary for space research, was in the race at last. Would she catch up? (Recent developments suggest that she has.)

Gagarin had been twenty-seven when he made his flight, a round-faced, snub-nosed youth of five feet two inches, son of a carpenter. His American successor was a man thirteen years his senior, who had been flying combat missions against the Japanese when Gagarin was in Primary School; an American product of an American city, surrounded by all the technology of the twentieth century. Gagarin, by way of contrast, had been born in the remotest of Russian villages, surrounded by nothing, for as far as the eye could see, but rolling fields of grain. Both had been keen to fly, from an early age, both had managed to get into the Services and fly there.

Gagarin in 1941 had been forced to hide with his mother from the invading German armies: he was eleven years old before he was

able to begin his schooling. Now he found that the only thing which really interested him was technology, and particularly aeronautics. He was sent off to Technical School in the industrial Moscow suburb of Lyubertsy, and here he could feast his eyes through the class-room window on aircraft from the nearby factory, being taken off, tested, landed, by their pilots. Soon his ambition was to become a test pilot himself. After waiting impatiently for several years, during which he worked in a factory by day and studied at night, he was able to enlist in the Soviet Air Force, in 1955. He passed out of the Training Centre with the highest honours, achieved his aim of becoming a test pilot and was soon selected for the special training of an astronaut.

John Glenn's origins were different. His father was a railwayman who went on, in the Ohio where John was born and brought up, to become the well-to-do owner of a motor business—a transition which would probably have been impossible in Russia. John was an honour student in High School, and in 1942—thirteen years before Yuri Gagarin clambered into the cockpit of his first aeroplane—he took a Naval course in flying. From this he went on to join the United States Marines as a pilot. He served with distinction in the Pacific, was promoted to captain and transferred to the Regular service. Then, after further combat experience in Korea, he became a test pilot. In 1957—the year of “Sputnik I”—he made the first non-stop supersonic flight across the United States; two years later he was selected—as Gagarin, thousands of miles away, had been—to undergo training for space flight.

We know little about the training regimen of the Russians but it is reasonable to assume that it was similar to the American one. The seven American astronauts-to-be were exposed to extremes of heat and cold, to strong forces of gravity followed by complete weightlessness (achieved in a centrifuge, and, later, in a diving aircraft), and a whole catalogue of the other conditions they might encounter in space. They practised desert and water survival, astronomy, aeronautics, meteorology, aviation biology and geography, and throughout all this were given physical and psychological tests at frequent intervals to see how they were reacting. In the United States each astronaut had to concentrate on one aspect of the programme: John Glenn's was cockpit layout, controls and instrumentation. To a considerable degree, the final design was his.

We know nothing of Yuri Gagarin's last hours before blast-off, but we do know that in Glenn's case the delay, the postponements of the flight, were enough to have shattered the confidence of a

lesser man. Two of the seven in training, Alan Shepard and Virgil Grissom, had already made sub-orbital flights into space (leaving the earth's atmosphere but not its force of gravity) in May and July of 1961—shortly after Gagarin's orbit—and Glenn's flight was scheduled for December of that year. It was then postponed no fewer than ten times as a result of weather conditions and technical hitches. On several occasions he lay strapped into his capsule on the launching pad at Cape Canaveral on the Florida coast (now Cape Kennedy) before learning the launch had been cancelled. Eventually, on 29 February, 1962, three hours after he had been closed into his capsule for an eleventh time, he was blasted off. When he returned to earth a few hours later he had circled it three times, had seen three sunsets, three dawns.

His capsule—to the television audience watching—was a tiny pimple on the nose of the huge Atlas-D rocket. It was fired at 09.47. At first it seemed hardly to be moving, just wobbling precariously in a cloud of smoke and vapour. Its name, "Friendship Seven"—a reference to the seven American astronauts—was clearly visible, painted in large letters round the side. Then, very slowly, that name, centre of a million television screens, wobbled away to the top right-hand corner, obscured by clouds of what seemed steam. There was a shrill, mounting, whine from the rocket, and then it began to crawl into a clear-blue, Florida sky. Its speed rose as it cleared the tower, but still, to viewers, it was too slow to be true: it was like some slow-motion film. Then it grew faster, rose rapidly, disappeared. Moments later it was visible again, a white-hot flare in the sky, growing smaller and fainter.

At an altitude of a hundred miles an electrical mechanism tilted the rocket and capsule, separated them so the capsule was free to travel alone on its orbit of the earth. From now on Glenn was in continuous contact with the ground, reporting what he saw, how he felt, how "Friendship Seven" was behaving. In fact, much of this reporting was done for him: his blood pressure, respiration rate, temperature, were radioed continuously to earth in a complex code which included details, as well, of the behaviour of the capsule itself, its temperature, its controls.

John Glenn's flight lasted four hours and fifty-six minutes. He had covered 81,000 miles, at altitudes between ninety-nine and a hundred and sixty-two miles, before it ended at 2.43 p.m., when "Friendship Seven" dropped into the sea off Puerto Rico and was picked up by a destroyer. (Unlike the various "Sputniks" and other un-manned satellites, which had been allowed to burn up on

re-entering the earth's atmosphere, as the friction of air on their skins heated them to incandescence, "Friendship Seven" had an arrangement of "retro-rockets" designed to slow it down at this critical point.)

The trip had been successful. Two things went wrong and were rectified: the hydrogen peroxide jets for controlling the capsule's balance behaved erratically, and Glenn took over manual control to let "Friendship Seven" complete its third and final orbit; and a faulty mechanism signalled to earth that the heat-shield, designed, in collaboration with the "retro-rockets", to prevent the capsule overheating during its descent, had become detached. The information was wrong: the descent worked smoothly.

The fact that an American had achieved orbital flight was of immense importance to American (and indeed Western) morale, which had suffered since the launching of the first Russian "Sputnik" in 1957. It seems likely that, though the Russian capsules were heavier, their rockets more powerful, the American control and reporting devices on "Friendship Seven" were considerably more sophisticated. Certainly the Russians have done less in the way of research satellites than have the Americans: the United States has put into orbit immensely complicated bundles of equipment varying in size and shape from a football to a sailing boat, with functions from simple measurement of cosmic radiation to a complete "space switchboard" between other "communications satellites" designed to relay television signals around the curvature of the earth.

The next stage in what, for reasons of prestige, has become a "space race", between the United States and the Soviet Union, is the landing of a man on the moon. Both sides have crashed spacecraft into the moon and have received television pictures of its surface (the Russians, of the previously unseen reverse side, taken from a distance of thousands of miles, the Americans, of the familiar side, but from distances down to less than one mile), and although there are indications that the Russians, for economic reasons, have slowed down their progress, it is likely that one or both will have men on the moon before 1980.

Already the epoch-making feats of Yuri Gagarin and John Glenn have paled into comparative insignificance. Yet, in years to come, when, perhaps, travel to and from the moon, possibly even to planets, has become a commonplace, children will still be taught about these two brave men, the first in their two countries to run the unknown risks of a journey into space.

## *The New Agrarian Revolution*

### *The Dilemma Posed by the Use of Toxic Chemicals on the Land*

IN THE year 1941 Switzerland, land-locked in its traditional neutrality between the warring nations of Europe, was hit by a plague of Colorado beetle. The Swiss authorities, fearing a serious food loss as a result of the depredations of this pest, which would be practically irreplaceable in war-time Europe, pressed their chemists to find a weapon with which to fight the dreaded beetle.

The research department of R. J. Geigy, a well-known Basle firm, were experimenting with a moth-proofing powder. They found that when they dusted the Colorado beetles with this powder they died as if by magic. The Swiss crops were saved and further experiments showed that the powder had the same lethal effect upon such insect pests as lice and fleas and the innumerable predators which infest agricultural crops.

This was a discovery of enormous importance which has affected the lives of every one of us, changed the face of the countryside and altered the economics of agriculture.

Its importance was not lost upon the Swiss, who deliberately leaked it to the British and American legations. Thereupon an extraordinary cloak-and-dagger operation ensued to get a consignment of the precious white powder to England. The underground route across Europe, followed by escaping P.O.W.s and secret agents, was used, and the operation was carried out in conditions of the greatest secrecy and security.

And so DDT was given to the world. It immediately became a high-priority war product, for its vital use in the field of battle was immediately obvious.

Dichlor Diphenyl Trichlorethane had been discovered in 1939 by a Swiss scientist, Paul Muller, and it was from the first a sensational success in the slaughter of insect pests, such as fleas and flies. Its effect is the complete disintegration of the insect's nervous system. When administered to animals DDT brought about a rather grim death, preceded by convulsions and spasms.

There was no reason to suppose that human beings could not be poisoned in a similarly unpleasant and lethal manner by DDT, but in its use as an insecticide its toxic qualities were diluted so that human beings were apparently unaffected by it. It is also a fact that small quantities of deadly poison are always finding their way into our bodies by one means or another, often without apparent damage, and are sometimes included in medical preparations. So it was hoped, and expected, that we would acclimatize ourselves to the poison of DDT.

DDT's first great success was in 1943 when it destroyed the infected lice in a serious outbreak of typhus at Naples. In three weeks DDT conquered the plague. Troops with DDT-impregnated clothes were effectively screened against the disease. Two years later the sad survivors of Hitler's concentration camps were cleansed with the magic chemical without apparent ill-effects. Later DDT destroyed the malaria-bearing mosquito in India.

And so in the 1940s DDT made its dramatic and sensational entry upon the scene of man's struggle with the inimical forces of nature. It seemed at first that some magic had been discovered by which he could at last conquer that part of nature he least understood—the insects which destroyed his food and spread disease.

Other chemicals were brought into the battle—aldrin, dieldrin and heptachlor, highly poisonous chlorines—and BHC was used when mosquitoes and houseflies developed a biological immunity to DDT.

Thus dawned the era of toxic chemicals. At first it seemed that it brought a new age in which the natural hazards attending food production had been overcome, and that the perils of insect-borne disease belonged to the past. The growing food crops were sprayed with toxic chemicals which destroyed the pests and brought about a marked increase in production; and the wonders of this new chemical agriculture were such that the produce could be eaten with complete safety by human beings. After spraying, crops had to be left for a stated time before being put on the market, in order that the effect of the poison which had killed the pests might wear off.

Malaria was reckoned to be a thing of the past. Household flies were almost curiosities.

Only a few warning voices were raised as the world entered this synthetic paradise. Those who doubted the wisdom of upsetting the balance of nature were dismissed in the same way as were those a half-century earlier who condemned aviation as being contrary

to nature. Naturalists who protested at the slaughter of wild life which resulted from the chemists' invasion of the land were told that with rising populations the expanding of man's food production was more important than wild life. Entomologists who reported that certain insects were developing biological resistance to the agricultural poisons were answered by the introduction of new chemical marvels of destruction against which nature had not yet discovered an antidote. But nature was not long in producing both a typhus louse and a malaria-bearing mosquito which were immune to DDT.

The feeling of disquiet about this war against nature increased as the battle of the chemical spray opened up on all fronts, including the home and the back garden. The fact that it received official blessing on account of the undoubted increase in agricultural yield which it produced lulled many people into the belief that the chemists must be right and that the promised land, in some respects at least, was here.

But it was only the people in the towns who thought this. The countryman knew differently. He knew the strange, even hideous things that were happening on the edges of the cornfields, in the hedgerows and in the thickets—of animals dying strange and terrible deaths, of blinded, tottering foxes unafraid of man or even of the hounds, of acres of blighted wild flowers, and of the toxic slaughter of birds on an alarming scale. The countryman did not like this strange and frightening new world which the era of the chemist had brought.

The blind acceptance with which the new chemical paradise had been received was giving way to serious questioning. At first the magic wand of chemical agriculture was eagerly grasped, for with it the farmer was able to control pests and weeds in a manner hitherto undreamed of. They thought that at last they had the complete answer to the primeval curse on the soil in the third chapter of Genesis.

Some caution, however, had been expressed at first. A 1946 newspaper picture of a tractor spraying corn with DDT draws attention to the high seats to keep the operators above the mist. Right from the start precautions were advised for the protection of the crews of toxic-spraying aircraft. Even the semi-informed knew that we were playing with a deadly poison, and that it was only because we had diluted it so much that we too did not join the insects and the foxes in their curious little dances of death.

The strange story of the poisoned foxes happened in 1959-60,

when farmers began to find foxes which did not run away when they approached them. They seemed to have lost their fear of humans. A closer look showed that these creatures were nearly blind and suffered from periodical convulsions.

The fox-hunting season had just started and many a Midland hunt was dismayed to find that the foxes would not run from the hounds and give them a chase. Instead they just waited blindly and helplessly to be killed. No less than 1,300 foxes were reported dead or dying in this mysterious way.

Various experiments were made, and there was no doubt at all in the minds of the scientists that these foxes, together with a large variety of other lowly creatures of the countryside, were one of the unplanned and unexpected side-effects of the application of certain toxic seed-dressings. These seeds had had a lethal effect upon pigeons which after eating them had died in convulsions, and whose tainted bodies had subsequently been eaten by the foxes.

The biologists were unable to prove their point for the simple reason that the chemists had produced a poison the side-effects of which were not fully understood by science. A disturbed government issued a report in 1961 which blamed this countryside slaughter on to lack of research on the part of the agricultural chemists.

John Coleman-Cooke, writing about this subject in a remarkable and disturbing book, *The Harvest that Kills*,<sup>1</sup> says: "One single grisly but inescapable fact emerges from the era of the great Fox Death. It is that a chemical designed for the legitimate protection of crops against pests can act in such a way in more than a thousand instances without anyone knowing what to do. The chemical which had called for immense time and the ingenuity of some of the finest chemical brains, had out-manoeuvred, as it were, its creators. It had hidden qualities which when coming into contact with processes in living creatures, defied detection." He points out that many toxic chemicals "ultimately produce serious side-effects which do not show up either in laboratory tests or field trials."

An even more sensational instance of how the agricultural chemists are playing with fire was the extraordinary disaster at Smarden in Kent in 1963, when a quantity of fluorocetamide "escaped" as the result of an industrial accident. Fluorocetamide is a well-known and effective rat-poison and is used in the making of insecticides.

At Smarden animals died wholesale, and a two-acre stretch of land was so badly contaminated that it became a matter of urgent

<sup>1</sup> Odhams, 1965.



government concern. Experts thought that these two acres of land were impregnated with poison to a depth of eighteen feet.

No one knew how to cleanse the land of the unmanageable poison. It was beyond man's control and completely out of hand. Man could only think of dumping it in that convenient depository, the sea, and many hundreds of tons of the contaminated soil were bound in concrete and dumped in some unnamed spot in the middle of the Atlantic.

The poisoned land at Smarden still remains an intractable problem. The latest proposal is to seal it off for ever in a gigantic concrete box so that its deadly poison will be contained—for nobody knows how long it will last in the soil, how deeply it will penetrate, and what its long-term effects will be.

"Having created the monster," says John Coleman-Cooke, "the chemists knew of no means to destroy it."

The question which was being asked by the unfortunate residents in the neighbourhood of Smarden, is the question which surely we should all be asking ourselves.

What effect is this contamination of the countryside going to have upon man?

Quantities of water from the contaminated land at Smarden were dumped into the sea at Dymchurch, and people along the South Coast not unwisely refused to buy locally caught fish in case it was contaminated with fluorocetamide. No one in the neighbourhood would eat locally shot pheasants or rabbits for the same reason.

DDT can affect man in the same way as it affects animals and insects. It is just a question of how strong the dose is. It affects the nerves and produces a kind of epilepsy. Scientists suspect that it may have long-term genetic effects.

The World Health Organization sounded a warning about toxic chemicals in 1963 and referred to "serious long-term genetic and ecological problems". The WHO investigated many accidents to humans who had been in contact with these toxic chemicals in various parts of the world. People had suffered injuries to their nervous systems. Their eyes had been affected and intestinal trouble had been caused.

In fatal cases (cautiously referred to in the report) the poison affects the whole body—heart, respiration, stomach and bowels—and there is a disintegration of the nervous system. In fact a man can be affected in the same way as were the foxes by these clouds of poison-gas which are sprayed upon the vegetables we eat.

People who undertake the spraying operations can fall victims to the poisons they are using, and have to take special precautions. When grain is sprayed before planting, the men who do it have to wear face-masks. When this grain is spilt on the ground, as it always is during sowing, it kills all the wild life who eat it. Cases are on record, both in England and elsewhere, of children being severely poisoned from playing with empty cans of insecticide. Spray-men in South America have been poisoned by their work, and at least one fatality has been reported.

DDT and similar poisons in our bodies can have side-effects we do not suspect. The poison can get into the system and cause fatal complications in a comparatively mild disease like influenza. A man who spent several days spraying his orchard with a toxic chemical, later collapsed with acute cardiac failure, the cause of which the pathologist was unable to determine, and so an open verdict was returned at the inquest.

You don't have to be in contact with the spraying of the chemicals to become affected by them. DDT has been found in human milk and it is thought that pregnant women are liable to be affected by it and can pass it on to the unborn child with results which can only be guessed.

The residues of pesticides in the food we eat is a problem which has been investigated by various official committees, and several attempts have been made to calm the public's fears.

By 1964 it was reckoned that over half the total acreage under crops was being chemically treated. Many of the staple foodstuffs bought in the shops contain hidden toxic residues. Traces of these chemicals have been found not only in vegetables, but also in meat, butter and milk. DDT is lavishly used in food factories, storage premises and slaughter-houses. This ubiquitous poison has in fact been found all over the world. So widespread has DDT become in natural life-cycles that it has now been found in the bodies of penguins and seals in the Antarctic.

Since 1943 this white powder, which came out of Switzerland as a life saver, has, with other similar chemicals, become a world-wide flood which is upsetting the balance of nature, poisoning the countryside, slaughtering animal and insect life, destroying flowers and other inedible growths, and which is now seeping into our own bodies, the effect of which we cannot know. Certainly the chemists and the scientists cannot tell us, because they do not themselves know. They are playing with a force they are unable to control and only partly comprehend—as was clearly seen at Smarden.

It is a dangerous and ignorant presumption to imagine that what will harm and kill animals will not harm us.

"The authorities have been dismayed", says Coleman-Cooke, "to find that the chemicals which promised such a Golden Age for British farming are poisoning the whole environment."

## *De Gaulle Returns to Power*

### *European and World Politics Take on a New Pattern*

THE GREAT events in the past shine out of history clearly; we have small doubts about the forces which swayed them one way or the other and fewer still about their consequences. With our own period it is different. We are aware that, since the war, great changes have shown themselves; yet the nearer we are to these changes, the more we participate ourselves in them, the less easy it is to see which are the significant events from which they received their momentum.

Let us take, for example, the movement, still unfinished, towards European unity, certainly one if not the, most important trends of the post-war epoch. Its beginning seems to us to lie partly in the inter-war period but mainly in the creation of various economic organisms such as the Schuman Coal and Steel pool of 1948, of Euratom, and by the Treaty of Rome in 1957, the Common Market. Yet there are other factors of equal importance which have helped towards the unity of Europe—the creation of the Council of Europe, of the North Atlantic Treaty Alliance of 1949 and, throughout the whole post-war period, the gradual reconciliation between France and Germany.

As one looks at the picture of the world since 1945 from a less great distance than historians will do some fifty or a hundred years hence, but with as much detachment as possible, one dramatic event stands out in European affairs, even if its meaning and its consequences are still by no means clear. This is the overthrow of the Fourth French Republic and the return of General de Gaulle to power.

In 1953, Paul Reynaud described France as "The Sick Man of Europe" and his phrase evoked no surprise. Unlike West Germany and Italy, who were still "working their passage" into Atlantic society after the war, France was nominally one of the victorious powers. Economically, she was only beginning to recover from the war; politically the state of France was disastrous. A large and vigorous Communist Party made parliamentary government

difficult. But the Fourth Republic governments could not use Communism as an excuse. Since 1946 there had been no less than fourteen changes of government. It was not only the changes of government that did the damage and the fact that at times of crisis in international affairs France was on several occasions without a government at all. It was the failure of weak coalitions in the National Assembly to pursue clear policies. For four years from 1950-4 France could not make up her mind about the European Defence Community, for instance.

The attitude of Britain and the United States was increasingly to regard France as a doubtful ally. If the French were oversusceptible, the way France was treated sometimes did not diminish the fierce reaction felt in France against what they considered France's subordination to the Anglo-Saxon powers. At the Bermuda Conference in 1953, for example, when the French Prime Minister, a rather undistinguished conservative, Joseph Laniel, arrived to confer with Eisenhower and Churchill, the Marseillaise was not played and, by an inconceivable error, Churchill and Eisenhower travelled together from the airport and Laniel was put in a car with the Foreign Ministers. A trifling incident? But it was galling to a proud nation.

Three years before 1954, a great French general, de Lattre de Tassigny, who might have saved the French position in Indo-China had he lived, had asked for greater American aid in the task of fighting the Communist rebels. The aid was refused. In 1953 and 1954, when French opinion was already inclined to see the wisdom of negotiating with Ho Chi Minh, the Americans suddenly stepped up military and financial aid and prevented France from ending the war. The terrible defeat at Dien Bien Phu came whilst France was at last trying to extricate herself from Indo-China.

When France had got out of Indo-China and more or less liquidated her discreditable and shifting policies in Tunisia and Morocco, a greater calamity fell on her, the civil war in Algeria. The Algerian revolt, at its beginning, was treated as of relatively small importance because the French could not believe that the bulk of the Algerian Muslims wanted to fight for independence. By 1955, however, the rebellion was serious; three cities in eastern Algeria were attacked simultaneously by rebel bands. By 1956 most of the army from Indo-China was in Algeria, two divisions were withdrawn from NATO and conscripts were drafted across the Mediterranean in large numbers. France had an army of half a million in the field, and was committed to a major military effort.

Many politicians realized that though the French Army was not likely to be beaten in battle, there was no purely military solution. But with a tough vigorous reaction of French public opinion on the Right, which wanted no dealings with the rebels, with the desperately bellicose Europeans of Algeria and with the feelings of the French Army that it would refuse to be betrayed again as it had been over Indo-China, there was small chance of a reasonable policy being evolved by a weak political system which the bulk of the nation already regarded with alternating indifference and contempt.

In January, 1956, a government headed by a Socialist Prime Minister, Guy Mollet, was elected, one of its avowed objects being to effect a cease-fire with the rebels, to be followed by negotiations. But it was the hour of the Man on the Spot, not of the government. In 1956, Mollet, on a visit to Algiers, was pelted with tomatoes by the Europeans; he was so impressed or depressed by what he saw that he cancelled the appointment of a strong liberal-minded Governor-General for Algeria and decided to follow a more or less nationalist line. Later, Mollet was about to start talks with the President of Tunisia and the King of Morocco which might have led to an Algerian solution. The French secret services, without the Prime Minister knowing, "kidnapped" the aeroplane carrying four Algerian leaders who were travelling as guests of the King of Morocco to a conference in Tunis.

An even greater catastrophe was the bombing of Sakhiet, a town inside Tunisia, by the French military who claimed that Algerian rebels were sheltering in the town. Gaillard, who was then Prime Minister, "covered" the military but, on the threat of a Tunisian appeal to the United Nations, agreed to the "Good Offices" mission of a British and an American diplomat to act as a mediator between France and Tunisia. Inevitably, the "Good Offices" mission was suspected of trying to interfere in Algeria. The outcry against them and the Gaillard government was tremendous. There was talk of a military coup in France unless a government of the most nationalistic politicians was formed at once. But the parliamentarians evidently did not believe there was a serious risk of a clash with the military. Gaillard fell in April and no government was formed in France for six weeks—and then the strange events of May took place.

On 13 May a one-day strike began in Algiers as a protest against the proceedings in Paris where it looked as though the National Assembly was going to elect Pierre Pflimlin, a Catholic Democrat, a most respected man, but who was suspected by the Europeans of

Algeria and by the Right of wanting to negotiate with the rebels. In the afternoon, rioters sacked the American Information Centre. At first the news aroused little alarm in Paris. Demonstrations by the "Ultras", as they were called—no one cared to admit that the Ultras represented most of Algeria's Europeans—were frequent and they had always been adequately controlled by the troops.

When the Deputies of the National Assembly adjourned for dinner around seven o'clock in the evening, the thoughts of most of them, except a very small minority who knew something was afoot, were occupied by quite other considerations than the doings of rioters. Should they give M. Pflimlin a majority, or after all look further to the Right? Should they try a national coalition under the Socialist Mollet, combining Socialists and Conservatives?

The riots were turning out very much more serious than usual. In the early evening a huge crowd swarmed up the great staircase, some half a mile long, to the Government General building, which dominates the city, and started fighting with the armed police in the square known as the Forum outside "the G.G.". On somebody's orders, the police were withdrawn and paratroopers took over. The paratroopers pushed the crowd about a little 'less than the police, and did little to restrain those who were anxious to capture "the G.G.". Indeed some paratroop sections actively helped the rioters. At 7.00 p.m. they had entered the building, burnt the cars of those who were working there and started to ransack the offices. Thousands of files were thrown out of the windows or burnt.

The military, half-heartedly, attempted to check the disorder. Around half past seven General Massu, the extremely popular Military Commander of the Algiers region, arrived in the building. He appeared to be angry. But at 7.45 he had agreed with the rioters to head a newly formed Committee of Public Safety, the aim of which was to take over control of Algiers and demand from France the immediate creation of a government of national union. General Salan, Commander-in-Chief of the French Army in Algeria, the Chinese General as he was called, arrived a little later. He was howled down by the mob when he tried to speak. The Committee of Public Safety broadcast its demand to the Metropolis. "No casualties fortunately in all this," commented an officer to a journalist, "except the Republic and that's not serious."

When the Deputies came back from dinner there were long festoons of ticker-tape dealing with the happenings in Algiers. The capture of the G.G. and the formation of the Committee of Public Safety aroused indignation and by four o'clock in the morning

Pfimlin had a much larger majority than expected, the Communists abstaining and only certain Right-wingers declaring themselves for a government which the Europeans in Algeria would accept.

Early that morning some Right-wing leaders were arrested and the government announced it would smash the revolt, and that if necessary Algeria would be blockaded. The fleet was put in readiness. But Pfimlin also took the step of giving General Salan emergency powers throughout Algeria, of making Salan in fact his delegate. He gambled on Salan and Massu having been forced to join the revolt in order to control it. Early next day, 14 May, it looked as though Pfimlin was right. Massu, at a Press conference, said that the Committee of Public Safety would only remain in power until a Minister came to Algeria. Both generals were extremely worried by Parliament's firm reaction.

The plotting in Algeria and in France, however, had gone a great deal deeper than the leaders of the European rioters, Salan or Massu, or the newly formed French government, realized. The Army commanders, particularly the colonels, were determined on a show-down with the whole political system which they regarded as weak and potentially dangerous to French interests. So too was a group of supporters of General de Gaulle headed by a young French industrialist, Delbecque, from the north of France. For him, as for some of the Army leaders who were plotting, the rioting had started just a little too early. Delbecque had hoped that Soustelle, the leader of the small Gaullist group in the National Assembly, very popular in Algeria where he had been Governor-General in 1955, would arrive. But Soustelle was under house arrest in Paris.

However, Delbecque's view was that a call for the return of de Gaulle would be backed certainly by some of the Army colonels and by some of the influential Europeans, even though the name of de Gaulle was not at all popular with the majority of Europeans in Algeria. And those who backed him had never been given any direct evidence that he was in favour of their cause. The Army leaders were not Gaullist either in their majority, but, on the 14th and the 15th of May, when they realized what a dangerous position they would be in if the government was going to hold out against the revolt, a government headed by de Gaulle seemed to them the only alternative to ignominious surrender to Pfimlin.

On 15 May, General Salan once more addressed the great concourse of people who seemed to station themselves permanently in the Forum as though to keep alive their Revolution. He was playing for time and he made an adroit speech, telling the crowd



that a government of national union to safeguard Algeria would come out of their struggle. He ended with the words, "Vive L'Algérie Française, Vive La France". The crowd cheered him. But as he stepped back, Delbecque, who was by then a member of the Committee of Public Safety, came up to him and forced him forward; Salan said, "et Vive de Gaulle." The cheering continued; it seemed even to grow louder.

This was the decisive moment of the revolt, for though there was only a handful of Gaullists in Algeria, the mention of de Gaulle had an electric effect in France. Generals, civil servants, industrialists who had been hesitating were now prepared to help an uprising which backed a nationally respected figure. Early in 1958 it had been the progressive Left, headed by Mendès France, which, in view of the worsening situation, had demanded the return of de Gaulle. President Coty himself had made overtures to the General. From the moment Salan reluctantly had shouted his "Vive de Gaulle", the revolt in Algiers took on something of the appearance of a national revolution. On 17 May, Soustelle, who had escaped in the boot of a car to Switzerland, arrived in Algiers. Salan was still playing a double game and had not officially broken with the government. But by then the Colonels and with them the easily swayed mob were solidly in favour of de Gaulle.

During all these four days, from the 13th to the 17th, the civil war in Algeria seemed to be suspended. The Algerian rebel leaders were watching. Muslims found the European crowds demonstrating against the Paris government comparatively friendly, and some Muslims were persuaded by the Army to demonstrate side by side with the Europeans. After the revolt had become Gaullist, there were in Algiers and Oran and Constantine some genuine Muslim demonstrations. For Muslims, de Gaulle meant the opposite to what he presumably meant to the rioters who had sacked the G.G.; so in this strange affair, opposites found themselves side-by-side.

General de Gaulle had only come to Paris from his home at Colombey in Champagne, once a week, to visit his publishers who were producing his war memoirs and to meet some of his intimate friends. He was, however, the best-informed man in France, and everybody, except the representatives of the political parties, visited him from time to time: everybody including people such as the Russian, Tunisian and Moroccan Ambassadors, the leaders of the French armed forces and the heads of the State departments.

He had, of course, known that Gaullist plotters were concerned with the events of 13 May, but he had no knowledge of their acts.

Indeed he had refrained from making any statement concerning his views on Algeria; he had refused, though strongly pressed by Soustelle, to make known, however vaguely, his attitude towards a French Algeria. All he would say was that until France created a strong State with a government which had authority, the problem of Algeria would go from bad to worse. This did not prevent the Europeans in Algeria from thinking that de Gaulle would never surrender Algeria and would support them; nor did it prevent reasonable Frenchmen from thinking that the General knew it was no good attempting to suppress Algerian nationalism and to fight against the tide of world affairs.

After General Salan's "*Vive de Gaulle*" of 15 May, de Gaulle issued a short statement to the Press saying, "I'm ready to assume the powers of the Republic." It was a typically ambiguous phrase and "assuming the powers" gave offence to the Parliamentarians. On 19 May the General gave a Press conference in Paris which the government was strongly urged to ban. The Communist trade unions tried to create a general strike but this was a failure. At the Press conference, General de Gaulle made it clear that on no account would he take power unless he was called on by the National Assembly to do so. Everyone knew, he said, his antipathy to dictatorship. He spoke in friendly terms of the Socialist leaders. When asked why he did not condemn the army in Algeria he raised a great laugh: "Let us be serious," he answered, "the government has not condemned the generals, on the contrary they have handed over their powers to them, why then should I, a private citizen?" For many Frenchmen it was suddenly apparent, however, that France had at least one great man among little men intriguing and fighting for position on both sides of the Mediterranean.

The Press conference established de Gaulle in many men's minds as the third choice between the rebel army and the ineffective government. It did not end the crisis however. Pflimlin received several large favourable votes in the National Assembly and he told journalists that it was a case of seeing who could hold out the longest. The Republic would fight the Algerian fascists. Throughout France, however, Right-wing groups and Gaullists were in full activity, not always in harmony with each other. Squadrons of the air force dipped their wings when flying over de Gaulle's house at Colombey. The independent newspaper *Le Monde*, which had given great support to the liberals in their protests against torture in Algeria, came out in favour of the de Gaulle solution.

Then on 24 May some delegates from Algiers landed in Corsica

and with the support of the Gaullists and of paratrooper battalions stationed in Corsica captured the island without firing a shot. A party of armed police surrendered to them. The newly elected Committee of Public Safety of Corsica started a long series of radio broadcasts to cities in the metropolis, urging them to assist in forming Committees of Public Safety and demanding a government headed by de Gaulle. The Minister of the Interior ordered the despatch of a battleship and troop transports to subdue Corsica. This was countermanded by Pflimlin, who described it as folly.

More and more it was clear that only an appeal to the Communists could produce a force in France capable of reacting to the threat from Algiers. A civil war and an alliance with the Communists appealed to few parliamentary leaders in principle; and it was not at all certain that the working classes, including the Communists, were any more than the middle classes prepared to take up arms for the government. The Fourth Republic in fact was dead long before it officially died and the public was indifferent to its fate. Such were the fruits of twelve years of government by "The System".

After Corsica, paratroop landings supported by garrisons in Paris and in South-west France might come any night, and only the likelihood of General de Gaulle's return to power warded off its danger. President Coty threatened to resign if the Party leaders could not agree to call on de Gaulle and, in spite of bitter opposition from his own Party, Guy Mollet saw de Gaulle. Gradually a majority for a de Gaulle government appeared a possibility. De Gaulle agreed to speak before the Assembly like any other Prime Minister. He was quite firm about being given powers to remake the constitution. But his provisional government would include Pflimlin and Mollet and a popular conservative leader, Pinay. He was invested on 1 June. The revolution was over. The General's speech at his investiture was short and conciliatory. As someone remarked, it might have consisted of one sentence: "Gentlemen, between you and the Seine is—Me."

The Gaullist revolution saved France from a military coup d'état and enabled, painfully and only after another four years, de Gaulle to solve the problem of Algeria. The Fifth Republic has given France stability which has been favourable to her steady economic growth. It has not perhaps supplied France with a political system which will outlast de Gaulle. Yet it is unlikely that French politics will ever return to the confusion and inefficiency which marked the Fourth Republic—though, of course, this is not absolutely certain. But, with whatever reservations one may make, France in

1965 could no longer conceivably be described as "The Sick Man of Europe" as she had been nine years before.

In 1957 the Six countries of Europe—France, West Germany, Italy, Belgium, Holland and Luxemburg—signed the Treaty of Rome, which brought into being the European Economic Community and the Common Market. France, however, in 1958, was ill-prepared to go into the Common Market. The French franc was weak, France's industries and agriculture, if they were to function successfully in an integrated Europe, had to undergo reconversion to larger and more efficient units, and technical modernization. It looked as though the Fourth Republic governments would not be able to face up to this task. De Gaulle, whom many people considered likely to be an enemy of European economic integration, decided to honour the Treaty. France, indeed, has played since 1958 the rôle of hurrying on rather than retarding the lowering of tariff barriers and the organization of the Market. De Gaulle immediately quickened the movement towards Franco-German reconciliation by his friendship with Dr Adenauer and his visit to Germany in 1962, which had an immense public success.

De Gaulle's actions inside the Atlantic Alliance have been much criticized. He has turned France into a nuclear power, with her own deterrent force. He has recognized Red China and generally emphasized his country's independence of the United States. The effect of his leadership cannot yet be properly judged. But many people in Europe, whether from the West or the East, consider that, apart from saving his country and therefore Europe from disruption in 1958, he embodies, with sagacity, a new spirit in the world, one which refuses to accept the domination of world politics by the two giants, the United States and the USSR. This was made possible by the strange revolution and by the plotters who overthrew the Fourth Republic in May, 1958.

# Index

- Absolute Monarchy, creation of, 289, 295,  
     371-2, 378, 381  
 Abu Bekr, 136-7, 139  
 Abyssinia, invasion of, 609  
 Act of Settlement, 316  
 Actium, battle of, 105-7, 127  
 Adrian I, Pope, 142-4  
 Adrianople, battle of, 125  
 Aeneas, 39  
 Agincourt, battle of, 199  
 Agricultural implements, early, 21  
 Agrippa, Roman general, 104-6  
 "Aids", 175-6  
 Aircraft, development of, 528-32  
 Aix-la-Chapelle, Treaty of, 593  
 Akheraton, creation and ruin of, 36  
 Akhnaton, 33-7  
 Akkad, 26  
 Alba Longa, 41  
 Albert or Hapsburg, Emperor, 482  
 Albrecht, Archbishop of Mainz, 246  
 Alcuin, 145  
 Alençon, Duke of, 199, 202-3  
 Alexander (the Great), King of Macedonia,  
     78, 141  
 Alexander I of Russia, Czar, 382-3, 385  
 Alfonso I of Portugal, King, 225  
 Alfonso III of Portugal, King, 226  
 Alfonso IV of Portugal, King, 226  
 Alfonso V of Portugal, King, 227  
 Alfonso VI of Castile, King, 225  
 Algeria, plotting and civil war in, 658-9  
 Amboyna, massacre of, 251  
 Anehu, 29  
 Amen-Ra, 33, 36  
 Amenhotep III, 31  
 Amenhotep IV (later Akhnaton), 31, 33  
 America, discovery of, 220-3  
 American War of Independence, 361-4, 424  
 Amiens, Treaty of, 381  
 Ampère, Andre, 409  
 Anaesthesia, discovery of, 436-41  
 Anaxagoras, 47  
 Anglo-Chinese War, 458  
 Animals, early domesticated, 21  
 Anne, Queen, 282, 288-90, 294, 311, 316-7  
*Antilha*, 218-9  
 Antoninus Pius, 129  
 Antony, Mark, 100, 102, 105-7, 127  
 Anuradhapura, 85  
 Archer, F. Scott, 433  
 Archimedes, 271  
 Arian Heresy, 125-6  
 Aristophanes, 75; *The Clouds*, 75  
 Aristotle, influence of, 78-80  
 Arkwright, Richard, 336-8  
 Ascanius, 40  
 Asclepius, 70-1  
 Ashley, Lord, *later* 7th Earl of Shaftesbury,  
     *q.v.*  
 Asoka of India, King, 81-6  
 Astronomy, foundation of modern, 237-41  
 Athanasius, 125-6  
 Athens, 64-7  
 Atomic developments, 579-84, 635  
 Atonement, Day of, 109  
 Attlee, Lord, 257  
 Augsburg, Treaty of, 277, 281  
 Augustinian Rule, The, 245  
 Augustus, Emperor, 102-4, 107, 128  
 Augustulus Romulus, 147  
 Austerlitz, 380  
 Australia, discovery of, 341-5  
 Averroes, 243  
 Babylonia, 25-7, 30  
 Babylonian captivity, 108  
 Bacon, Francis, *Novum Organum*, 79  
 Bacon, Roger, 189  
 Baird, J. L., 514, 573  
 Baldwin I, King, 212  
 Baldwin, Stanley, 610  
 Banks, Sir Joseph, 341, 343, 345  
 Barras, Paul, 377-8  
 Bastille, storming of, 373, 387, 553  
 Bayeux Tapestry, 154  
 Baylen, battle of, 385  
 Berquerel, Henri, 516, 519, 581  
 Bedford, 6th Duke of, 417  
 Belgium, invasion of, 612  
 Belisarius, 212  
 Bell, Alexander Graham, 487-91, 576  
 Bell-Coleman refrigerator, 419-20  
 Benedict V, Pope, 152  
 Bengal, 229  
 Berengar, King, 151-2  
 Bertrada, Queen, 142  
 Besant, Mrs. Annie, 498-503  
 Bessemer, Sir Henry, 453-7  
 Bhagavad-Gita, 50  
 Biddle, Commodore, 458  
 Bismarck, Prince Otto von, 485-6, 538, 606  
 Black, Clementina, 502  
 Black Death, The, 193-8, 272  
 Blenheim, battle of, 293, 311-4  
 "Blitz, The", 616-8  
 Blomberg, General von, 609-10

# INDEX

- Blood circulation, theory and discovery of, 265-8
- Blood Purge, Hitler's, 607
- Blücher, Gebhard, General, 389, 391
- Boats, early, 23
- Boleyn, Anne, 261
- Bombay, 252
- Borsig, August, 454
- Bosnia-Herzegovina, 540
- Bourbons, 281, 483
- Botany Bay, 342-3
- Boxer Rebellion, 537
- Boyle, Robert, 346-7
- Boyne, battle of, 310
- Brabazon, Lord, 530
- Bragg, Sir William, 408
- Brahminism, 49, 53-4
- Brauchitsch, Field Marshal von, 627-8
- Brains Trust, 601
- Branly, Edouard, 509
- Bretigny, Treaty of, 199
- Britain, battle of, 613-7, 619
- Britain, invasion of by Caesar, 99
- British Commonwealth, extent of, 429-30, 591
- British Expeditionary Force, 547-50
- British Museum, 27
- Brown, Samuel, 493
- Browne, Robert, 263
- Brunel, Isambard Kingdom, 406
- Buddhism, 51-5, 61, 83-5
- Bull, Rev. G. S., 443-5, 448
- Bülów, General von, 549, 551
- Bunker Hill, battle of, 361-2
- Burgoyne, General, 362
- Burgundy, Duke of, 199
- Burma, conquering of by Japan, 623
- Burrows, Herbert, 498-9, 502
- Byzantine Empire, collapse of, 132
- Cabal administration, 317-8
- Cabinet administration, creation of, 320
- Cabot, John, 218, 327, 591-2
- Cabot, Sebastian, 592
- Cabrinovic, 541
- Caesar, Caius Julius, 98-103
- Calcutta, 228, 252; Black Hole of, 254
- Caligula, Emperor, 128
- Calvin, John, 195
- Calvinism, 279, 281
- Camera, invention and development of, 431-5
- Canada Act, 425, 427, 595
- Canute, King, 153
- Caracalla, Emperor, 129
- Carolingian Dynasty, 148
- Carloman, King, 141, 148, 481
- Carthage, site of, 90; defeat of by Rome, 87-93
- Cartier, Jacques, 327
- Cartwright, Edmund, 337-8, 414
- Catherine of Aragon, Queen, 260-1
- Caxton, William, 210
- Cayley, Sir George, 530
- Censor, 525
- Ceylon, 84-5, 229, 251, 429
- Chadwick, Sir James, 582
- Champion, Herbert, 498-9
- Champlain, Samuel de, 327
- Ch'an, 62
- Chang Tao-lin, 61
- Charlemagne the Great, King, 141-5, 147, 161, 276, 481
- Charles I, King, 282-8, 300, 323, 375, 402, 449
- Charles II, King, 252, 288-9, 292, 301, 306-7, 317, 328, 592
- Charles V, Emperor, 247, 482
- Charles V of France, King, 199
- Charles VI of France, King, 199-200
- Charles X of France, King, 450
- Charles V of Spain, King, 261
- Charter Oath, 459
- Chatham, William Pitt, 1st Earl of, 330-3, 344, 376
- Chaucer, Geoffrey, *Canterbury Tales*, 210
- Chiang Kai-shek, 619, 623, 640-1
- Ch'in, Prince of, 637-8
- Chinese Communism, emergence of, 637-41
- Chloroform, 437
- Chou, Duke of, 637
- Chou Dynasty, 637
- Choukoutien caves, 18
- Christian IV, King, 279
- Christianity, birth and development of, 108-13, 122-6
- Christians, persecution of, 124-5
- Churchill, Sir Winston, 380, 556, 564-5, 611, 615-6, 618-9, 622-4, 626, 655
- Chuang-tze, 61
- Chu Teh, 641
- Chu Yuan-chang, 639
- Civil Wars, 269, 284-5
- Civilization, early Indian, 81-2
- Civilization, Greek influences on early Western, 68
- Civilization, Roman benefits to, 93
- Clarendon Code, establishment of, 301
- Clarendon, Earl of, 301
- Claudius, Emperor, 128
- Clemenceau, Georges, 563-4, 566
- Clement VII, Pope, 261
- Cleopatra, 103-7, 127
- Clerk, Dugald, 494-5
- Clermont, Council of, 164
- Clive, Robert, 253, 594
- Cloth, early manufacturing of, 22
- Clovis of the Franks, King, 141
- Cobbett, William, 444
- Cocaine, 440
- Columbus, Bartholomew, 219-20
- Columbus, Christopher, 219-23, 227, 230, 263, 591
- Commonwealth, Emergence from Empire, 591-7
- Communism in Russia and the October Revolution, 553-9

# INDEX

- Confederation of German states, formation of, 483
- Confucius, 57-62, 637
- Confucianism, 56-62
- Congregationalists, the, 263
- Congress of the Soviets, 557
- Constantine XI, Emperor, 212-3
- Constantine the Great, Emperor, 121-6, 131, 159-60, 211
- Cook, Captain James, 340-3, 345, 426, 595
- Coote, Sir Eyre, 594
- Copernicus, Nicholas, 237-41, 273, 521
- Coral Island, battle of, 623
- Cornelius, Roman centurion, 117
- Coming, Leonard, 441
- Cornwallis, Lord, 363-4
- Cortes, Hernando, 232, 234-6
- Cos, island of, 71
- Coster, Lawrens, 208
- Coty, President, 659, 661
- Courtenay, William, Archbishop of Canterbury, 244
- Crassus, 99
- Crécy, 199
- Crompton, Samuel, 337-8
- Cromwell, Oliver, 284-5, 287-8, 424, 449, 592
- Crookes, Sir William, 504-6
- Crusades, The, 165
- Crusaders, formation of, 164, 166, 212
- Cuban crisis, 431
- Cultivation, early, 20-2; improvements in, 324-6
- Curie, Madame Marie, 507-8, 515-20
- Curie, Pierre, 516-20
- Curzon, Lord, 257
- Cyclopropane, 440
- Cynoscephalae, battle of, 96
- Czechoslovakia, absorption of, 612
  
- Daguerre, Louis, 432-3, 435
- Daimio, 456-9, 533
- Daimler, Gottlieb, 492-3, 495, 497
- Dalhousie, Lord, 255-6
- Danton, Georges, 375, 377
- Darby, Abraham, 414
- Darius of Persia, King, 63-4
- Darwin, Charles, 468-74, 521; *Origin of Species*, 471, 475; *The Descent of Man*, 473
- Darwin, Erasmus, 472
- Dauphin, the, 199-204
- Davy, Sir Humphry, 409-10, 438
- Declaratory Act, 360
- Defoe, Daniel, 334
- Democritus, 47, 71; his theories, 47-8
- Denain, battle of, 293
- Denmark, occupation by Germans, 612
- Desiderius, Duke of Tuscany, 142
- Diaz, Bartolomeo, 218-9, 227
- Dido, 39
- Diesel, Rudolph, 495
- Diocletian, Emperor, 121-2, 131, 211
- Diogenes of Apollonia, 74
- Diogenes, Romanus, Emperor, 162
- Dionysius the Elder, 76
- Dispersion, the, 115
- Disraeli, Benjamin, 256, 418, 538, 545
- Divine Right of Kings, the, 304, 307, 368
- Domesday Book, 157, 322
- Duma Parliament, 553, 555
- Duncan, Admiral, 382
- Dunkirk, evacuation from, 612
- Dunois, 199
- Dupleix, François, 253
- Durham, Lord, 427, 430, 595
- Durham Report, 427-8, 595
  
- Early achievements, 18-23
- Early scientific philosophies, 44-8
- East India Company (British), founding of, 250-3, 256, 360, 594
- East India Company (French), 253
- Eastman, George, 433
- Edessa, capture of, 165
- Edgehill, battle of, 269
- Edward, Prince of Wales (The Black Prince), 199
- Edward the Confessor, King, 153-4
- Edward I, King, 182-3, 302-3
- Edward II, King, 303
- Edward III, King, 196, 199
- Edward IV, King, 248, 262
- Edward VII, King, 544
- Edwin, King, 153-4
- Einhart, 145
- Einstein, Albert, 241, 271, 275, 508, 566, 580-2
- Eisenhower, President Dwight, 655
- El Alamein, 631
- El Dorado, 231
- Elector of Saxony, the, 246-7
- Electricity, discovery of, 408-12
- Elgin, Lord, 427
- Elizabeth I, Queen, 217-8, 250, 262, 282, 289, 304-5, 318, 424
- Elizabeth II, Queen, 247
- Empedocles, 47
- Empire Loyalists, 343-4
- Engels, Friedrich, 476-7
- Enghien, Duke of, 381
- English Revolution, 449
- Eugene of Savoy, Prince, 293, 311-4
- Euratom, 654
- European Common Market, 358, 654, 662
- European Economic Community, 662
- Evolution, Darwin's Theories on, 468-74
- Evolutionists, 468
  
- Fabian Society, 498
- Factory Acts, 442, 446
- Faraday, Michael, 408-12, 438; *Experimental Researches in Electricity*; *Chemical Manipulation*; *Lectures on the Non-Metallic Elements*; *Lectures on the Chemical History of the Candle*, 412

# INDEX

Fawkes, Guy, 187-8  
 February Revolutions, 452-3  
 Ferdinand, Archduke Franz, assassination of, 540-2, 566  
 Ferdinand II of Bohemia, King, 278, 482  
 Ferdinand V of Spain, King, 220, 227, 230  
 Feudal system, 169-72, 180, 302  
 Fielden, John, 444, 447  
 Fifth Republic, formation of, 661  
 Finch, Ralph, 249  
 Fire, early evidence of, 18  
 FitzRoy, Captain, 469-70  
 Flandin, Pierre, 611  
 Fleming, Sir Alexander, 585, 589  
 Fleming, Sir John, 512  
 Fleures, battle of, 376  
 Florey, Howard, 588  
 Foism, 56  
 Forms, Theory of, 74  
 Fontenoy, battle of, 150  
 Forest, Lee de, 512-3  
 Fouquet, Nicolas, 290  
 Fourth Republic, overthrow of, 661-2  
 Fox, Bishop, 242  
 Fox, Charles James, 387-8  
 France, battle and invasion of, 1940, 612-3  
 Francis I of France, King, 261  
 Francis II, Emperor, 483  
 Frankfurt Parliament, 484  
 Franklin, Benjamin, 410  
 Franz Joseph, Emperor, 539  
 Frederick William IV, King, 454, 484-5  
 French, Sir John, 548-9, 551  
 French Revolutions, 295, 371-9, 387, 449, 477, 538, 553  
 Freud, Sigmund, 475, 521  
 Friedland, battle of, 384  
 Fritigern, Visigoth leader, 132  
 Frontenac, Comte de, 328  
 Fukuoka, revolt in, 535  
 Fundamentalists, 468  
 Gabor, Bethlen, 278, 280  
 Gagarin, Yuri, 643-6  
 Gage, General, 361-2  
 Galba, Emperor, 128  
 Galen, 71-2, 265-6  
 Galerius, 122, 124  
 Galileo, 240  
 Gallieni, General, 549-52  
 Gallienus, 129-30  
 Gama, Vasco da, 228-9, 340, 591  
 Garbez, 541  
 Gaulle, President Charles de, 548, 613, 654, 658-9, 661-2  
 Gauss, Karl, 271  
 Gautama, Siddhartha (Buddha), 51-5  
 Gelo, Tyrant of Syracuse, 65  
 Genghis Khan, 141, 639  
 George I, King, 294, 316, 318-20  
 George II, King, 413  
 George III, King, 320, 359, 424-5  
 George IV, King, 387

George V, King, 597  
 German Peasants' Revolt, 247  
 Gieffy, R. J., 647  
 Gilbert, Sir Humphrey, 424, 592  
 Girondins, 375, 377  
 Gladstone, William Ewart, 418, 545  
 Glenn, John, 643-6  
 Goa, 249, 251  
 Goebbels, Paul Josef, 604  
 Goering, Hermann, 604, 614-7, 629-30  
 Goethe, Johann, 371, 379  
 Graham, Cunningham, 502  
 Gravitation, development of theories on, 240  
 Great Wall of China, 638  
 Greco, El, 321  
 Greek defeat of Persian Empire and effects of, 63-8  
 Gregory XI, Pope, 243  
 Grey, Sir Edward, 543  
 Grey, Lord, 417-8  
 Grijalva, Juan de, 232  
 Grimes Graves, 22  
 Grissom, Virgil, 645  
 Guericke, Otto von, 347  
 Guistiniani, Giovanni, 214, 216  
 Gunpowder, invention of, 187-92  
 Gunpowder Plot, 187-8, 192  
 Gustavus Adolphus of Sweden, King, 280-1  
 Gutenberg, Johann, 207-10  
 Habeas Corpus Act, 299-301, 388  
 Haifa, 89  
 Hakim, Caliph of Cairo, 161  
 Halley, Edward, 274-5  
 Hamilcar, Carthaginian leader, 91  
 Hammurabi, Code of Laws, 25-30  
 Hampden, John, 283  
 Han Dynasty, 638  
 Hannibal, Carthaginian general, 91-2, 96, 498  
 Hapsburgs, 281, 482-3  
 Harald Hardrada of Norway, King, 153, 155  
 Hargreaves, James, 336, 338, 414  
 Harold II, King, 154-8  
 Haroun-el-Raschid, Caliph, 161, 212  
 Harvey, William, 72, 265-70  
 Hastings, battle of, 153-8  
 Hastings, Warren, 254, 594  
 Headlam, Rev. Stuart, 498  
 Heads of Proposal, 284  
 Hegel, Georg, 476, 479  
 Hellespont, crossing of, 63-5, 68  
 Henrietta Maria, Queen, 282  
 Henry I, King, 167  
 Henry II, King, 168, 180, 184, 308, 317  
 Henry III, King, 181-2  
 Henry IV, King, 226  
 Henry V, King, 199-200  
 Henry VI, King, 200  
 Henry VII, King, 220, 316  
 Henry VIII, King, 186, 247-8, 260-1, 318  
 Henry the Fowler, King, 150



# INDEX

- Henry IV of France, King, 289, 295, 309  
 Henry the Navigator, Prince of Portugal, 226-7  
 Henson, W. S., 530  
 Herodotus, 64, 67-8  
 Herschel, Sir John, 433  
 Hertz, Heinrich, 509  
 Hindenburg, President, 560, 566, 604-5  
 Hippocrates, 69-73  
 Hippocratic Method, the, 69-73  
 Hippocratic Oath, the, 70-1  
 Hiroshima, atomic attack on, 632-6  
 Hitler, Adolf, 94, 380, 559, 567, 604-5, 607-8, 612-3, 616-7, 623-4, 626-9, 631, 648; *Mein Kampf*, 607  
 Holland, invasion of, 1940, 612  
 Homer, 71, 437  
 Hong Kong, 623, 640  
 Howe, Sir William, 362-3  
 Human affairs, economic revolutions in, 20  
 Hundred Days, The, 388-9  
 Hundred Years War, The, 199  
 Huskisson, William, 404  
 Huss, John, 244  
 Hutcheson, Francis, 353  
 Hu-Jev Professor Thomas, 473  
 Huygens, Christiaan, 346, 493
- Ibsen, Henrik, 539  
 Ice Age, 19, 321  
 Independence, Declaration of, 362  
 India, Empress of, 594  
 India, granted Independence, 429  
 Indian Mutiny, 256  
 Industrial Revolution, 351, 414, 418, 454  
 Innocent III, Pope, 174, 177, 226  
 Internal combustion engine, invention of, 492-7  
 International Communist League, 477  
 Isabella of Spain, Queen, 220, 227, 230  
 Isaiah, 108  
 Islam, founding of, 134-40  
 Ivan the Terrible, Czar of Russia, 276
- Jamaica, 592  
 James I of England, King, 187-8, 250, 263, 269, 278, 282-3, 300, 304-6, 308, 316, 592  
 James II, King, 190, 285, 288, 310, 593  
 Japan, 456; anti-Comintern pact signed with Germany, 619  
 Java Sea, battle of, 623  
 Jemmapes, 376  
 Jena, battle of, 384-5  
 Jesus, life and teaching of, 110-3  
 Jet-engine, development of, 532  
 Jimmu, Emperor, 460  
 Joan of Arc, St., 200-5, 378; her qualities, 204-5  
 Joffre, General, 548-51  
 John of England, King, 158, 173, 178, 181, 218, 299  
 John I of Portugal, King, 226
- John XII, Pope, 151  
 John XIII, Pope, 152  
 Judaism, 115  
 Jury system, introduction of, 167-72
- Kalingas, defeat of, 82-3, 85-6  
 Kamenov, Leo, 555  
 Kanagawa, Treaty of, 458  
 Kay, John, 335, 338  
 Kepler, Johann, 240  
 Kerensky, Alexander, 556-7  
 Kimmel, Rear-Admiral Husband, 622  
 Kings Council, 180-1  
 Kipling, Rudyard, 539  
 Kluck, General Alexander von, 549-51  
 Knowledge, Platonic Theory of, 77  
 Konoye, Prince, 619  
 Korea, 535, 537, 638  
 Kornilov, General, 556-7  
 Kossuth, Lajos, 453  
 Krapina, 18  
 Krupp, Alfred, 454  
 Kublai Khan, 639  
 Kumanoto, revolt in, 535  
 Kuomintang, 640  
 Kurusu, Saburo, 620  
 Kyushu, rebellion in, 535
- Lamarck, Jean, 472  
 Langton, Stephen, Cardinal, 175, 177  
 Lao-tze, 57-9  
 Latinus, 40  
 Laud, Archbishop, 283  
 Laurentum, 39  
 Laval-Montmorency, Cardinal, 328  
 Law-making, early, 25-30  
 League of Nations, advocacy of, 563, 566  
 League of Princes, 483  
 Leipzig, battle of, 386  
 Lenin, Vladimir Ilyich, 480, 553, 555-9  
 Leonardo da Vinci, 530  
 Leonidas, King of the Spartans, 65-6  
 Leo III, Pope, 144  
 Leo VIII, Pope, 152  
 Leopold of Hohenzollern, Prince, 486  
 Letter of Majesty, 278  
 Libido, 524  
 Licinius, Emperor, 124-5, 131  
 Light, Isaac Newton's Theory of, 271-5  
 Lilienthal, Otto, 530  
 Liu Pang, 638  
 Livy, 39  
 Lloyd George, David, 561, 563-4  
 Locarno Treaty, 603, 609-10  
 Lodge, Sir Oliver, 509-10  
 Logic, 79  
 Lollards, The, 244  
 London, The Great Fire of, 197  
 Louis XIII of France, King, 289, 309  
 Louis XIV of France, King, 205, 282, 288-95, 307, 309, 314, 371

# INDEX

- Louis XVI of France, King, 343, 367, 372, 375, 387  
Louis XVIII of France, King, 374, 388-9, 450  
Louis the Pious, King, 148-50  
Louis Philippe, King, 378, 450-1  
Louisburg, 331-2  
Louvre, Paris, 27  
Loyola, Ignatius, 276  
Luddites, The, 338  
Luneville, Treaty of, 381  
Luther, Martin, 240, 245, 248, 260, 276  
Lysozyme, 586-7
- Macedonian Wars, 97  
Machine Age, arrival of, 339  
Maddox, R. L., 433  
Madras, capture of by Dupleix, 253  
Magna Carta, 178-9, 299-300, 303, 308  
Mahabharata, 50  
"Manhattan Project", 583  
Mahinda, Prince, 84  
Malacca, 229  
Malaya, 249; state federated, 1957, 429; fall of, 1941, 623  
Malplaquet, battle of, 203  
Malthus, Rev. T. R., 472  
Manchuria, 639  
Manuel of Portugal, King, 228  
Manstein, General von, 629  
Manzikert, battle of, 162  
Mao Tse-tung, 640-1  
Marathon, battle of, 63-4  
Marconi, Alfonso, 510-1  
Marconi, Guglielmo, 509-14, 576  
Marco Polo, 207, 225  
Mardonius, General, 67  
Marengo, battle of, 381  
Marie Antoinette, Queen, 373  
Marie Louise, wife of Napoleon I, 389  
Marlbrough, Duke of, 293-4, 310-4, 328  
Marne, battle of, 548  
Marsin, Marshal, 311, 313-4  
Marston Moor, battle of, 284  
Marx, Karl, 475-80  
Marxism-Leninism, 480  
Marxism, principles of, 478-80  
Mary II (Mary of Orange), Queen, 288, 307, 310, 318, 593  
Massu, General, 657-8  
Matilda, Queen, 167  
Maxentius, 122  
Maximilian I, Emperor, 482  
Maximilian of Bavaria, General, 279-80  
Maximus, Quintus Fabius, 498  
Maxwell, Clerk, 509-10, 513-4; *Theory of Electricity and Magnetism*, 509  
Mazarin, Cardinal, 289-90, 309  
Mazzini, Giuseppe, 453  
Mecca, 134-9  
Medical science, development of, 69-73  
Meiji Constitution, 536  
Meiji, Emperor, 459, 533-4  
Meiji Reformation, 461
- Meitner, Lise, 582  
Melancthon, Philip, 247  
Mendel, J. G., 474  
Mercantile System, 355  
Mesolithic Age, 20  
Mesopotamia, 25  
Metternich, Clement, 453  
Mexico, 235  
Mezentius, 40-1  
Middle Stone Age, 20  
Midway Island, battle of, 623  
Miletus, 45  
Milvian Bridge, battle of, 122  
Ming Dynasty, 62, 639  
Mining, 22  
Minorca, 329  
Mirabeau, Honoré, 374  
Model Parliament, 185-6, 302  
Mogul Empire, disintegration of, 252-3  
Mohammed, 134-9, 160-1  
Mohammed I, King, 212  
Mohammed II, King, 213-7  
Moir, Lord, 255  
Mollet, Guy, 656, 661  
Moltke, Count Helmuth Ludwig von, 542-4, 547, 549, 551  
Monarchy, Establishment of Constitutional, 302-8  
Monroe Doctrine, 598  
Montcalm, Marquis de, 330-3  
Monteagle, Lord, 187-8  
Montezuma II of Mexico, Emperor, 234-6  
Montford, Simon de, Earl of Leicester, 181-2, 317  
Montgomery, 1st Viscount, 631  
Morcar, 153-4  
Moscow, German attack on, 627-8  
Moscow, Napoleon's retreat from, 385-6  
Moslem, 138  
Moslem Moors, 140  
Mountbatten of Burma, 1st Earl, 257  
Muller, Paul, 647  
Mushkenu, 29  
Mussolini, Benito, 559, 609, 623, 631
- Nagasaki, 635-6  
Napoleon Bonaparte, Emperor, 141, 292, 295, 343, 378, 380-94, 398, 450, 483, 538, 552, 617, 625  
Napoleon III, Emperor, 378, 485-6  
Napoleon, Joseph, King, 384  
Napoleonic University, 450  
Naseby, battle of, 284  
National Industrial Recovery Act, 602  
Nazi-Soviet Pact, 606, 619  
Nefertiti, Queen, 32-3, 35  
Nelson, Horatio, Viscount, 382  
Neolithic Age, 20-3  
Nero, Emperor, 128  
Newcomen, Thomas, 346, 348  
New Deal, 598, 601, 603  
New Economic Policy, 558  
New Stone Age, 20, 22-3

# INDEX

- New Zealand, discovery of, 341-2, 345  
 Newton, Isaac, 240, 271; *Principia*, 271-5;  
*Opticks*, 271, 274  
 Ney, Marshal, 388, 390  
 Nicaea, 162  
 Nicholas II, Czar of Russia, 543, 545, 553-4,  
 557, 559  
 Nicomachus, 78  
 Niepce, J. N., 432, 434-5  
 Nietzsche, Friedrich, 539  
 Nightingale, Florence, 370  
 Nile Valley, 23, 25  
 Nimwegen, Treaty of, 293  
 Nipkow, Paul, 576  
 Nobel Prize for Physics, award of, 519  
 Norman Conquest, 153-8, 173, 180, 296,  
 302  
 North Atlantic Treaty Alliance, 654-5  
 North, Lord, Regulating Act of 1773, 254  
 Norway, occupation by Germans, 612  
 Numantia, capture of, 97  
 Numitor, King, 42
- Oersted, Professor Hans, 409-10  
*Of the*, 535-6  
 Old Stone Age, 17, 20, 22  
 Olduvai Gorge, 17  
 Omar, Caliph, 160-1  
 Opium War, 276  
 Orkhan, 212  
 Orleans, Duke of, 199  
 Orleans, siege of, 201  
 Othman, 212  
 Otho, Emperor, 128  
 Otto I, King, 150-2, 276  
 Otto, Professor, 494, 497  
 Oudenard, battle of, 293  
 Ourique, battle of, 226  
 Owen, Robert, 395, 442, 444  
 Oxenstierna, Count, 281
- Palaeolithic Age, 18  
 Palaeologus, Michael, 212  
 Palatine, Elector of Bohemia (Palsgrave),  
 278-9  
 Papin, Denis, 346-7  
 Paris Peace Conference, 561  
 Park, Air Vice-Marshal, 615-6  
 Parliament, foundation of, 181-6  
 Paul the Deacon, 145  
 Paul, St. of Tarsus, 114, 118  
 Paulus, General von, 629-30  
 Pausanias, Spartan leader, 67-8  
 Pavia, siege of, 142  
 Peasants' Revolt, 244  
 Peace of Augsburg, 248  
 Peace of Nuremberg, 247  
 Pearl Harbour, 462, 618, 621, 628, 630  
 Peel, Sir Robert, 399, 417, 447  
 Peking Man, 18  
 Penicillin, discovery of, 585-90  
 Peninsular War, 388
- Penn, William, 593  
 Peoria, Illinois, 588-9  
 Pepin the Short, King, 141-2, 145, 148-9  
 Pepys, Samuel, 275  
 Pericles of Athens, 127  
 Perkins, Jacob, 421  
 Perry, Commodore, 458, 461-2, 533-4  
 Persian invasion of Eastern Empire, 160;  
 defeat of Persians, 63-8  
 Pétain, Marshal, 548, 612  
 Peter, St, 117, 123  
 Peter's Pence, 261  
 Petition of Rights, 301  
 Pfimlin, Pierre, 656-8  
 Pharaoh, 31  
 Pharsalia, battle of, 100  
 Philip II of France, King, 174  
 Philip II of Macedonia, King, 78  
 Philip V of Macedon, King, 96  
 Philip II of Spain, King, 263  
 Philippi, battle of, 102-3  
 Philippines, Japanese invasion of, 622-3  
 Philosophical thought, foundations of, 74-80  
 Phoenicians, the, 89-90  
 Picasso, Pablo, 321  
 Pilcher, Percy, 530  
 Pilgrim Fathers, 264, 592  
 Pitt, William, the Elder, *see* 1st Earl of  
 Chatham  
 Pitt, William, the Younger, 254, 320, 380,  
 382, 387-8, 425, 595  
 Plassey, battle of, 254, 329, 594  
 Plataea, battle of, 64, 67-8  
 Plato, influence of, 76-80; *Dialogue*, 76; *The  
 Republic*, 77; *The Symposium*, 76  
 Poitiers, 199, 202  
 Pompey, 99-100  
 Powered flight, first, 529  
 Prague, Defenestration of, 278  
 Preece, William, 412  
 Prehistoric achievements, 18-23  
 Pressburg and Jenő, Treaty of, 385  
 Preston, battle of, 285  
 Princip, Gavrilo, 541-2  
 Printing, the art of, 206-10  
 Privy Council, formation of, 317-9  
 Prometheus, 408  
 Protestantism in Europe, establishment of,  
 277-81  
 Ptolemy, 238  
 Punic Wars, 91, 96-7  
 Punjab, annexation of 1849, 255  
 Pym, John, 283  
 Pyrrhus of Epirus, 88-9
- Quakers, 371  
 Quebec, capture of, 330-3  
 Quebec Act, 361  
 Quesnay, François, 355
- Ra, Sun-god, 33  
 Radium, discovery of, 515-20

# INDEX

- Radium Institute, foundation of, 519  
 Ragged Schools, establishment of, 447  
 Railway, early developments, 402-7  
 Raleigh, Sir Walter, 592  
 Ramayana, 50  
 Ramillies, battle of, 293  
 Rasputin, 554  
 Ratisbon, Diet of, 280  
 Reade, J. B., 433  
 Reform Bills, 417-8, 427, 442-3  
 Reformation, inauguration of, 243-4  
 Refrigeration, development of and process, 419-23  
 Relativity, Theory of, 241, 508, 568-72, 580-1  
 Religious differences, 115-7  
 Religious influences on early laws, 29; and the Reformation, 243-4  
 Remus, 41-2  
 Renaissance, The, 211-7  
 Rhea Silvia, 41  
 Rhodes, Cecil, 428-9  
 Richard II, King, 318  
 Richelieu, Cardinal, 280, 289, 309, 327  
*Risorgimento*, 452  
 Riukiu Islands, annexation of by Japan, 537  
 Rivers, Lord; *The Dictes or Sayengis of the Philosophers*, 210  
 Robespierre, Maximilian, 377, 380  
 Robinson, John, 263-4  
 Roman annexations, 96  
 Rome; assumes Imperial status, 127; emergence of as Power, 94-101; decline of as Power, 129-30; founding of, 38-43, 89-90, 92, 100, 127  
 Rome, Treaty of, 654, 662  
 Rommel, Field Marshal, 630-1  
 Romulus, 41-3  
 Romulus Augustulus, Emperor, 133  
 Röntgen, Wilhelm Conrad, 504-8, 516, 580  
 Roosevelt, President Franklin D., 583, 598, 601, 603, 607, 618, 620  
 Roses, Wars of the, 316  
 Roundheads, 284-5  
 Rousseau, Jean Jacques, 371  
 Royalists, 284-5  
 Runnymede, 178  
 Ruprecht of Bavaria, Prince, 546, 548  
 Russell, Lord John, 417  
 Russia, invasion of by Germany, 625  
 Russian-Japanese War, 537  
 Russian Revolution, 553, 559  
 Rutherford, 1st Baron, 271, 580-1, 584, 636  
 Ryswick, Treaty of, 292, 328  
 Sancho I, King, 226  
 Sanghamitra of India, Princess, 84  
 Sarajevo, 533  
 Savery, Thomas, 346, 348  
 Schlieffen Plan, 544, 547  
 Schulze, Johann, 432  
 Schuman Coal and Steel pool, 654  
 Schwartz, Berthold, 189-92  
 Scipio, Roman general, 91-2  
 Scutage, 175-6  
 Scutari, battle of, 125  
 Semites, 26  
 Senlac Hill, battle of, 156  
 Sestus, 68  
 Seven Years War, 253, 330, 333, 359, 424  
 Sèvres, Treaty of, 561  
 Shaftesbury, 6th Earl of, 445  
 Shaftesbury, 7th Earl of, 442-5  
 Shaw, George Bernard, 498, 539  
 Shepard, Alan, 645  
 Shintoism, later State Shintoism, 460-2, 534, 537  
 Shoguns, 456-60, 533-4  
 Short, Lieutenant-General Walter, 622  
 Sicily, Allied invasion of, 631  
 Signs, invention of, 24  
 Simpson, James Young, 437, 439-40  
 Singapore, surrender to Japanese, 623  
 Sino-Japanese war, 537  
 Slave Trade, abolishment of, 388  
 Smith, Adam, 352-7; *Wealth of Nations*, 352, 355, 475  
 Smith, Vincent, 86; Oxford History of India, 86  
 Smyrna, 162  
 Social War, 97  
 Socrates, 75-7  
 Soddy, Frederick, 581  
 Somerset, Edward, 346  
 Soustelle, Jacques, 658-60  
 South Sea Bubble, 319  
 Soviet Union, invasion by Hitler, 618  
 Space, first flights into, 642-6  
 Spanish Armada, defeat of, 249, 388  
 Spanish Succession, Wars of, 292-4, 311  
 Sparta, 64-5  
 Spice Islands, 251  
 Stalin, Joseph, 555, 626-7  
 Stalingrad, battle of, 628-31  
 Stamford Bridge, battle of, 155  
 Stamp Act, 182, 360  
 Statute of Westminster, 184-5  
 Steam engine, invention of, 346-51, 406-7  
 Stephen of Blois, King, 167  
 Stephenson, George, 350, 402, 404-5  
 Stockton and Darlington Railway, development of, 402-7  
 Stone Age occupation, 25  
 Stonehenge, 23  
 Strategy, military and naval, 64-8, 213-7; at Actium, 104-5; Austerlitz, 383-6; Blenheim, 311-4; Great War, 547-52; Hastings, 156-7; Zama, battle of, 92-3

# INDEX

Sui Dynasty, 638  
 Sumatra, 229  
 Sumerians, 25  
 Sun Yat-sen, Dr., 640  
 Suraj-ud-Dowlah, 254  
 Susa, 27  
 Switzerland, plagued by Colorado beetle, 647

T'ai-ping Rebellion, 640  
 Talbot, Fox, 433, 435  
 Tallage, 181  
 Tallard, Marshal, 311-4  
 Talleyrand, Charles, 366-8  
 Tamerlane the Great, 212  
 T'ang Dynasty, 638  
 Taoism, foundation and influence of, 56-62  
 Taranto, 88  
 Tarquinius Superbus, revolt against, 95  
 Tasman, Abel, 341-2  
 Tasmania, 345  
 Teleology, Theory of, 79  
 Telephone, invention of, 487-91  
 Television, arrival of, 573-8  
 Tell el-Amarna, discoveries at, 32, 36  
 Ten Hours' Bill, 443-4, 447  
 Tenison, Dr., 272  
 Tennessee Valley Authority, 601  
 Tenochtitlan (renamed Mexico), 234-5  
 Test Act, repeal of, urged, 417  
 Texel, 376  
 Thailand, Japanese invasion of, 622  
 Thales, 45; scientific discoveries, 45-7  
 Themistocles of Athens, 66  
 Theodulf, 145  
 Theodorus, 76  
 Third Estate, formation of, 372  
 Thirty Tyrants, the, 129  
 Thirty Years War, 309, 482  
 Thomson, Professor J. J., 580-1  
 Thucydides, 71  
 Thurii, 88  
 Tiberias, battle of, 165  
 Tiberius, Emperor, 128  
 Tilly, General, 280  
 Tissa, King, 85  
 Titov, 643  
 Titus, Emperor, 159  
 Tiyy, Queen, influence of, 32, 36  
 Tojo, Admiral, 620  
 Tokugawa, 456-7, 459, 534  
 Tolstoy, Leo, 539  
 Toscanelli, 227  
 Tosti, 153-4  
 Townshend, 2nd Viscount, 319, 325, 415  
 Townshend, Charles, 360  
 Toxic chemical era, 648-53  
 Trafalgar, battle of, 382  
 Transubstantiation, doctrine of, 244  
 Transport, mechanical, 492-7  
 Trichlorethylene, 440, 647  
 Triple Monarchy, proposed plan, 540  
 Troas, 119

Trotsky, Lev, 556-7  
 Troy, siege of, 87-8  
 Truck Acts, 500  
 Tull, Jethro, 324, 326; *Horse-hoeing Husbandry*, 324, 326  
 Turkistan, annexation of, 638  
 Turnus, 40  
 Tutankhamen, King, 36  
 Tyre, 89  
 Ulm, 382-3  
 Union Act, 595  
 United States, economic boom and collapse, 599-600  
 United States, entry into Second World War, 617  
 United States founded, 425  
 Universal Franchise, first step, 413-8  
 Urban II, Pope, 163-4  
 Utrecht, Treaty of, 293-4, 314, 325, 328, 593  
 Vacuum tube invented, 504  
 Valmy, battle of, 393, 553  
 Vedism, 49  
 Velazquez, Don Diego, 232, 235  
 Venice, conquering of, 145  
 Verdun, battle of, 552; Treaty of, 150  
 Versailles, Court of, 292  
 Versailles, Treaty of, 561-3, 566-7, 591, 593, 605, 607, 609-10, 612  
 Vespasian, Emperor, 128, 159  
 Vesta, Virgins of, 18  
 Victoria, Queen, 406, 425, 428, 456, 489, 511, 594, 596  
 Vienna, Congress of, 389, 394, 538  
 Villiers, Charles, Duke of Buckingham, 283  
 Visigoths, struggles with Huns, 131-2  
 Vitellius, Emperor, 22  
 Volta, Alessandro, 409-10  
 Voltaire, François, 371  
 Wagram, battle of, 385  
 Wales, Prince of, later King Edward VII, 256  
 Wallace, Alfred Russel, 471  
 Wallenstein, Albrecht von, General, 279-80, 482  
 Walpole, Sir Robert, 319, 325  
 Wandewash, battle of, 329  
 Wardu, 29  
 Washington, Colonel George, 329, 361-4, 598  
 Waterloo, battle of, 387, 483, 616  
 Watson, Thomas, 488-9  
 Watt, James, 346, 348-51, 354, 414  
 Wattignies, battle of, 376  
 Webb, Beatrice, 503  
 Webb, Sidney, 498, 503  
 Welfare State, and influence of Robert Owen, 395-401

# INDEX

- Wellesley, Richard Colley, Marquess, 255, 594  
 Wellington, Duke of, 385-6, 388-93, 404, 594  
 Wells, H. G., 539  
 Wells, Horace, 438, 441  
 Wentworth, Thomas, Earl of Strafford, 283  
 West Indies Company, 327  
 Westminster, Statute of, 597  
 Wheel, invention of, 23  
 White Hill, Prague, battle of, 279-80  
 Whittle, Sir Frank, 532  
 Wilberforce, Bishop, 473  
 Wilberforce, William, 388  
 Wilhelm II, Kaiser, 538, 540, 542-4, 547, 549, 552, 560, 564  
 Wilkinson, John, 414  
 William the Conqueror, 153, 157, 322  
 William I of Prussia, King, 486  
 William III, King, 308, 317  
 William of Orange, King, 288, 293, 307, 310-1, 316, 593  
 William the Silent, Prince of Orange, 278  
 Wilson, George, 437  
 Wilson, President Woodrow, 563-5  
 Wireless, early experiments in, 509-14  
 Witenagemot, supreme court, 297  
 Wolfe, James, General, 330-3, 593  
 Wollstonecraft, Mary, 365; *A Vindication of the Rights of Women*, 365, 369; *Thoughts on the Education of Daughters*, 366  
 Women's Rights, early preparations for, 365-70  
 Worms, Diet of, 247  
 Wright, Orville, 528-31  
 Wright, Wilbur, 528-31  
 Wu Wang, 637  
 Wycliffe, John, 243-4  
 X-rays, discovery of and method, 504-8  
 Xerxes, King of Persia, 63-4, 66-7  
 Yamaguchi, revolt in, 535  
 Ypres, 552  
 Zama, battle of, 92-3, 96